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Compendium of Definitions and Acronyms for Rail Systems

Abstract: This compendium was developed by the Technical Services & Innovation Department and published by the American Public Transportation Association (APTA) to provide a glossary of commonly used definitions and acronyms in documents such as standards, recommended practices, and guidelines, so there is consistency within the rail transportation industry.

Summary: APTA, through its subsidiary the North American Transit Services Association (NATSA), develops standards, recommended practices and guidelines for the benefit of public rail transportation. These tasks are accomplished by working groups consisting of members from rail transit agencies, manufacturers, consultants, engineers and other interested groups. Through the development of these documents, working groups have created a wide array of terms and abbreviations, many with varying definitions. This compendium has been developed to standardize the usage of such definitions and acronyms as it relates to rail operations, maintenance practices, designs and specifications.

This document is dynamic in nature in that, over time, additional definitions and acronyms will be included. It is APTA's intention that the document be sufficiently expanded at some point in the future to provide common usage of terms encompassing all rail industry requirements.

Scope and purpose: This compendium applies to all rail agencies that operate commuter rail, heavy rail (subway systems), light rail, streetcars, and trolleys. The usage of these definitions and acronyms are voluntary. Nevertheless, it is the desire of APTA that the rail industry apply these terms to all documents such as standards, recommended practices, standard operating practices, standard maintenance practices, rail agency policies and procedures, and agency rule books.

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Introduction

The *Compendium of Definitions and Acronyms for Rail Systems* reflects common terminology used in the rail industry by rail operating and planning agencies, manufacturers, consultants, engineers and general interest groups.

The definitions and acronyms have been compiled using existing terms mainly in APTA standards, recommended practices, and guideline documents. This document is dynamic in nature and as such will be updated to accommodate new terminology as new terms emerge. APTA's goal with this document is to one day be sufficiently broad enough to cover all rail related activities.

It is recognized that it is not possible to capture all the definitions and acronyms used in the rail industry. However, the intent of this document is to identify as many as possible, specifically the most commonly used terms so as to standardize their usage. This document can also be useful to those new to the industry who may not be familiar with some of the terms.

Some definitions and acronyms referenced in this document may have slightly different explanations or more than one definition. Different explanations are shown as bulleted items. Numbered items all relate to the same definition. Where more than one explanation is shown, the user should use language that best reflects the intent of the rail agency document.

References and source material for definitions and acronyms are provided where available. Where none are available, common usage over time as used in the rail industry is the source for such terms.

The user is also referred to various other valuable resources such as:

- The Association of American Railroads (AAR)
- American Railway Engineering and Maintenance-of-Way Association (AREMA)
- Institute of Electrical and Electronics Engineers (IEEE)
- Federal Railroad Administration (FRA)
- Federal Transit Administration (FTA)
- National Transit Database (NTD)

Each revision to this compendium will show a revision number and date on the front page.

This document will not be subjected to the normal APTA standards development process of requiring public comment, CEO or various Policy and Planning Committee approvals prior to publication.

The use of any terms contained in this document is voluntary. The distribution and publication of this compendium is provided as a service to the rail industry. Neither APTA nor its employees are responsible for use or misuse of any material contained in this document.

If there are errors or new terminologies, please send your comments to APTA at standards@apta.com quoting the source/s.

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Definitions

NOTE: Some article sources and references can be found at the foot appropriate pages. Additional material is at the end of this document.

A

AAR-Class Bearing

Bearings manufactured in accordance with the "*AAR Manual of Standards"*, Section H, "Journal Bearings and Lubrication," for use on bearing seat diameters as described.

Abandonment

- In public transportation operations, a procedure whereby a carrier ceases operation on all or part of its lines and routes with permission from the appropriate regulatory authorities.
- With rights-of-way, the relinquishment of the public interest in right-of-way or activity thereon with no intention to reclaim it or use it again for transportation purposes; also known as vacation.

Abdominal Compression Criterion

Peak *x*-axis deflection measured at each abdominal sensor, filtered at CFC600.

Abdominal Viscous Criterion (VC)

A value calculated according to the following formula, using the *x*-axis data from each abdominal sensor, filtered at CFC600:

Abdominal VC = V(t) x C(t),
Where
V(t) = instantaneous abdominal velocity (m/s)
C(t) = instantaneous abdominal compression ratio, C(t)=D(t)/DAB
D(t) = instantaneous abdominal compression (mm)
DAB = depth of the uncompressed abdomen test device (mm)

Absolute Block

A block that no train is permitted to enter while it is occupied by another train without appropriate procedure and authorization.

Absolute Permissive Block System (APB)

A block signal system under which the block is usually from siding to siding for opposing movements an d the fixed signals governing entrance into the block display an aspect indicating Stop when the block is occupied by an opposing train. For following movements, the section between sidings is divided into two or more blocks and train movements into these blocks, except the first one, are governed by intermediate fixed signals, cab signals, or both. The intermediate fixed signals usually display an aspect indicating stop; then proceed at restricted speed, and the cab signal displays an aspect indicating Proceed at Restricted Speed, as its most restrictive indication.

Absolute Stop

A signal indication which requires a train to stop and not proceed.

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AC Inverter
A device for converting direct current (DC) electricity into alternating current (AC) electricity using partial DC voltage rectification to simulate AC current at a specified frequency, usually 60 Hz in North America.

AC Track Circuit
An ac electrical circuit that makes use of both rails to detect train occupancy of the track and, in response, to actuate signals, train control devices and grade crossing protective equipment.

Acceleration
Increase in velocity per unit time; in transit, usually measured in feet per second squared (meters per second squared) or, in the United States, sometimes in miles per hour per second.

Acceleration Rate
Time rate of change of speed of a vehicle.

Acceptable Fire Risk
- Fire performance characteristics created by combining fire hazard severity information available and fire scenario probability for a given category of equipment and service determined to be in the "no corrective action required" region of the fire risk matrix.
- A combination of available fire hazard severity information and fire scenario probability for a given category of equipment and service determined to be inside Category 4 "Acceptable" risk region of the fire risk matrix requiring no corrective action.

Access [See also Controlled Access]
Permission, liberty, or ability to enter, approach, or make use of.

Access, Controlled
In transportation, to have entry and exit limited to pre-determined points, as with rail rapid transit or freeways.

Access Equipment
Any vehicle entryway accessory that deploys to aid the boarding of passengers including steps that deploy when doors are opened.

Accessibility
- A measure of the ability or ease of all people to travel among various origins and destinations.
- In transportation modeling and planning, the sum of the travel times from one zone to all other zones in a region, weighted by the relative attractiveness of the destination zones involved.
- In traffic assignment, a measure of the relative access of an area or zone to population, employment opportunities, community services, and utilities.
- The extent to which facilities are free of barriers and fully accessible by mobile handicapped people, including wheelchair use.

Accessible Transportation Facilities
Transportation facilities that are barrier-free, allowing their use by all travelers, including the mobile physically handicapped, elderly, and transportation disadvantaged.)

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Accident
(As defined for Public Transportation systems subject to FTA safety regulation)

- An event that involves any of the following: A loss of life; a report of a serious injury to a person; a collision of public transportation vehicles; a runaway train; an evacuation for life safety reasons; or any derailment of a rail transit vehicle, at any location, at any time, whatever the cause.[1]

Accident/Incident
(As defined for FRA-regulated railroads)

- Any impact between railroad on-track equipment and a highway user at a high-rail grade crossing. The term "highway user" includes automobiles, buses, trucks, motorcycles, bicycles, farm vehicles, pedestrians, and all other modes of surface transportation motorized and unmotorized;
- Any collision, derailment, fire explosion, act of God, or other event involving operation of railroad on-track equipment (standing or moving) that results in reportable damages greater than the current reporting threshold to railroad on-track equipment, signals, track, track structures, and roadbed[2]

Accountable Executive
A single, identifiable person who has ultimate responsibility for carrying out the Public Transportation Agency Safety Plan of a public transportation agency; responsibility for carrying out the agency's Transit Asset Management Plan; and control or direction over the human and capital resources needed to develop and maintain both the agency's Public Transportation Agency Safety Plan, in accordance with 49 U.S.C. 5329(d), and the agency's Transit Asset Management Plan in accordance with 49 U.S.C. 5326.

Acoustical Listening Device
A rudimentary-low frequency vibration monitor that transforms the minute impacts from mismatched or distressed rolling and sliding elements into audible pressure waves that can be heard through an air tube stethoscope or seen by observing the plot of electrical signals generated by a transducer monitoring the same energy.

Acre
Along railroad right-of-way, approximately 8 feet (2.44 m) wide by 1-mile (1.61 km) long.

Act of God
A natural and unavoidable catastrophe that interrupts the expected course of events, such as earthquakes, floods, hurricanes, tornados, other high winds, lightning, snow and ice storms.

Action Point
The position where a function or task is performed. Such functions may include, but are not limited to, activities such as reading a label or operating a release mechanism.

Active Illumination
Illumination which is generated by electrical energy.

Active Grade Crossing Warning
The system used to inform road users of the approach or presence of a trains at highway-rail crossings which includes flashing light signals and necessary control equipment and may or may not include warning gates.

Active Vehicles in Fleet
The vehicles in a particular fleet at year-end that are available to operate in revenue service.

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Including:
- Spares
- Vehicles temporarily out of service for routine maintenance and minor repairs

Actual

Passenger Car Hours
The hours that passenger cars travel while in revenue service (actual passenger car revenue hours) plus deadhead hours.

Including:
- Revenue service
- Deadhead
- Layover/recovery time
- Passenger loading time

Passenger Car Miles
The miles that passenger cars travel while in revenue service (actual passenger car revenue miles) plus deadhead miles.

Including:
- Revenue service
- Deadhead

Passenger Car Revenue Hours
The hours that passenger cars travel while in revenue service.

Including:
- Revenue service
- Layover/recovery time
- Passenger loading time

Passenger Car Revenue Miles
The miles that passenger cars travel while in revenue service.

Including:
- Revenue service
- Layover/recovery time
- Passenger loading time

Point
The end of the switch rail farther from the frog, where the spread between the gauge lines of the switch rail and the stock rail is sufficient for a practicable switch point.

Service
The total service operated during each time period. Actual service is measured by vehicles in service, in miles and hours.

Excluding:
- Missed trips
- Service interruptions (e.g., strikes, emergency shutdowns)

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Train Hours
The hours that trains travel while in revenue service (actual train revenue hours) plus deadhead hours.

Including:
- Revenue service
- Deadhead
- Layover/recovery time

Excluding:
- Hours for charter services
- Operator training
- Vehicle maintenance testing

Train Miles
The miles that trains travel while in revenue service (actual train revenue miles) plus deadhead miles.

Including:
- Revenue service, and
- Deadhead

Excluding:
- Miles for charter services
- Operator training
- Vehicle maintenance testing

Train Revenue Hours
The hours that trains travel while in revenue service.

Including:
- Revenue service
- Layover/recovery time

Excluding:
- Deadhead
- Training operators prior to revenue service
- Vehicle maintenance tests
- Charter services

Train Revenue Miles
The miles that trains travel while in revenue service.

Including:
- Revenue service

Excluding:
- Deadhead
- Training operators prior to revenue service
- Vehicle maintenance tests

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- Charter services

Vehicle Hours

The hours that vehicles travel while in revenue service plus deadhead hours.

Including:
- Revenue service
- Deadhead
- Layover/recovery time

Excluding:
- Hours for charter service
- School bus service
- Operator training
- Vehicle maintenance testing

Vehicle Miles

The miles that vehicles travel while in revenue service (actual vehicle revenue miles (VRM)) plus deadhead miles.

Including:
- Revenue service
- Deadhead

Excluding:
- Deadhead
- Training operators prior to revenue service
- Vehicle maintenance tests
- Charter services

Vehicle Revenue Hours (VRH)

The hours that vehicles travel while in revenue service.

Including:
- Revenue service
- Layover/recovery time

Excluding:
- Deadhead
- Operator training
- Maintenance testing
- School bus and charter services

Vehicle Revenue Miles (VRM)

The miles that vehicles travel while in revenue service.

Including
- Revenue service

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Excluding:
- Deadhead
- Operator training
- Maintenance testing
- School bus and charter services.

ADA
American with Disabilities Act of 1990. Federal Law which requires that facilities and services be made accessible to persons with disabilities.

ADA Accessible Stations
Public transportation passenger facilities which, in compliance with ADA requirements, provide ready access and do not have physical barrier that prohibit and/or restrict access by individuals with disabilities, including individuals who use wheelchairs.

ADA Accessible Vehicles
Public transportation revenue vehicles which, in compliance with ADA requirements, do not restrict access, are usable, and provide allocated space and/or priority seating for individuals who use wheelchairs, and which are accessible using lifts or ramps.

ADA Related Unlinked Passenger Trips (UPT)
THE number of passengers who board public transportation vehicles for complimentary paratransit services (demand response (DR)) associated or attributed to the American with Disabilities Act of 1990 (ADA) compliance requirements. The number of Americans with Disabilities Act of 1990 (ADA) unlinked passenger trips (UPT) should be less than or equal to the total number of unlinked passengers' trips. These trips are reported only for demand response (DR) mode. ADA-related service reported to NTD should not include any categorical service (i.e. Services that are not available to the general public such as: Medicaid, Meals-On-Wheels, Head Start, sheltered workshops, independent living centers, etc.) Also not included is service funded by the New Freedom program.

Adjacent Track[3]
Means two or more tracks with track centers spaced less than 25 feet apart.

Adjustable Tables
Fixed tables that have moveable parts, such as a hinged or sliding portion of the tabletop, designed for improved ingress/egress.

Adjusting/De-stressing
The procedure by which a rail's temperature is re-adjusted to the desired value. It typically consists of cutting the rail and removing rail anchoring devices, which provides for the necessary expansion and contraction, and then reassembling the track.

Adzing Machine
Portable, power-operated machine designed to adze the rail seat on ties to provide proper bearing for rail or tie plates.

Aerial Condition
Any abnormal condition that requires the attention or intervention of responsible personnel or an individual monitoring the transit system operation.

Aerial Inspection

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An inspection done on an overhead electrical distribution system where the inspector is at the same level as the overhead equipment being inspected.

Aerial Structure
In transportation, any system structure that carries transit tracks and spans above land or water surfaces.

Aerial Tramway (TR)
A transit mode that is an electric system of aerial cables with suspended powerless passenger vehicles. The vehicles are propelled by separate cables attached to the vehicle suspension system and powered by engines or motors at a central location not on-board the vehicle.

Aerial Tramways (TR)
Unpowered passenger vehicles suspended from a system of aerial cables and propelled by separate cables attached to eth vehicle suspension system. Engines or motors at a central location, not onboard the vehicle, power the cable system.

Aerial Tramway (TR) Lines Miles
The distance from terminal to terminal following the path of the tramway towers.

Air Cushion System[4]
An air inflated cushion for safely absorbing the impact of a body falling from great heights having upper and lower sections connected together and also interconnected by air feed holes, the lower one being relatively closed and at a higher pressure, and the upper one including normally closed breathers or quick air release structures and being at a lower pressure, all the basic dimensions and physical relationships of which follow certain unique equations developed in the present invention. The breather system, which allows quick but controlled release of the air pressure built-up in the upper section upon impact of a body, includes two, opposed mouth or lip-type breathers and two, opposed, weighted, flap type breathers, both of which are biased by elastic straps appropriately tensioned and are self-closing. The cushion is inflated through the lower section by a continuously running fan system which includes a uniflow flap check valve.

Air Cushion Vehicle[5]
A vehicle that travels just above the surface of land or water on a cushion of air provided by a downward jet from its engines, propellers, etc.

Air Pollution[6]
Can be defined as the presence of toxic chemicals or compounds (including those of biological origin) in the air, at levels that pose a health risk. In a sense this means the presence of chemicals or compounds in the air which are not usually present, and which lower the quality of the air or cause detrimental changes to the quality of life**.**

Air Quality[7]
The degree to which the ambient air is pollution-free, assessed by measuring a number of indicators of pollution.

Air Rights
The space located above, at, or below (subterranean) the surface of the ground, lying within the project's property limits.

Air Supply System

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Components used to transform, ambient, breathable air to a pressurized state with controlled temperature, humidity, oil, and solid contents, suitable for use as the energy source for rail vehicle air brakes and auxiliary device operation. An air supply system may be either individual components located closely and conveniently together, or in a unitized package suitable for direct mounting to a vehicle, generally including motor and compressor, governor controls and protection, as well as the inlet air filter, air dryer and intercooler, and/or aftercooler.

Aisle
A path through a vehicle, which is not bordered by, walls, e.g., down the center of a coach car with a row of seats on each side.

Alarm
Audible sound designed to provide warnings in a working environment.

Alarm Circuit
An electrical path utilized to transmit a signal that indicated an alarm condition from a remote location to a local or central reporting location.

Alarm Condition
Any abnormal condition which requires the attention or intervention of responsible personnel or an individual monitoring the transit system operation.

Alert System (alert)
The audio and visual equipment installed to provide warnings in a working environment.

Alignment
In transportation, the horizontal and vertical ground plan of a roadway, railroad, transit route, or other facility as it would appear in plan and profile. The alignment is usually described on the plans using technical data, such as grades, coordinates, bearings, and horizontal and vertical curves.

Alternating Current (AC) Ground Detector
A device used to monitor ac power supplies for grounded conditions and to display an alarm when ground conditions are detected.

Alternative Fuel[8]
A fuel for internal combustion engines that is derived partly or wholly from a source other than petroleum and that is less damaging to the environment than traditional fuels.

Alternatives Analysis
A detailed study and assessment of the various options available for the purpose of selecting one for implementation. Ideally, all feasible alternatives will be investigated. An alternatives analysis is required if funds are sought from the Federal Transportation Administration for capital-intensive major transportation projects.

Ambient Air Quality
A physical and chemical measure of the concentration of various chemicals in the outside air, usually determined over a specific time-period, for example, 1 minute, 1 hour, or 1 day.

Ambient Temperature
The environmental temperature surrounding the object under consideration. Where electrical heating wire

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is enclosed in thermal insulation, the ambient temperature is the temperature exterior to the thermal insulation.

- The temperature of the local surroundings. Inside a temperature-controlled building, ambient temperature is the same as room temperature.
- The temperature of liquid or air surrounding any electrical part or device.

Ambulatory Handicapped[9]

1. Has a physical and permanent disability to such a degree that the person is unable to move from place to place without the aid of a wheelchair.
2. Is not able to cross curbs because of paralysis or loss of function of the person's legs.
3. Is missing one or both legs.
4. Has a permanently impaired or unsteady gait that makes it impossible or impractical to walk as a means of transportation.

Americans with Disabilities Act of 1990 (ADA)

- Federal law that requires that facilities and services be made accessible to individuals with disabilities.
- A civil rights law passed by Congress in 1990, which makes it illegal to discriminate against people with disabilities in employment, services provided by state and local governments, public and private transportation, public accommodations, and telecommunications.

Ampacity [Also referred to as amps]

Current-carrying capacity, expressed in amperes, of an electrical conductor under stated thermal conditions.

Amplifier

Electronic equipment that increases the voltage, current, or power of signals passing through it.

Anchorage[10]

A secure point of attachment for lifelines, lanyards or deceleration devices that is independent of the means of supporting or suspending the employee.

Anchor

The component that interfaces the coupler assembly to the vehicle. It contains the main pivot bearing and pivot pin. The resilient coupler assembly support frame is attached to the pivot pin in self-supporting couplers designs. It may also contain a centering system and secondary collision release feature.

Anchors

Rail anchors installed on the base of the rail securely against the side of the tie to resist longitudinal movement of rail.

Anchor, backup

A rail anchor applied to control rail movement during anchoring procedures

Anchor bolt

A bolt or threaded rod that holds a direct fixation fastener to supporting concrete. An anchor bolt is fastened into a female insert in the supporting concrete. A threaded rod may be cast or grouted into the supporting concrete.

Anchor, box

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Four rail anchors on the running rails at one tie with two anchors on each rail, one on each side of the tie. anchor, contact rail: An insulated assembly attached to both the contact rail and invert or ties to restrain the contact rail against thermal movement in the longitudinal direction.

Anchor, rail
A device installed on the rail base designed to resist longitudinal rail movement due to traffic and temperature variations.

Ancillary Facility
Subsidiary locations for housing personnel engaged in the organization's activities. These are usually located at strategic stations. They may be permanent or temporary.

Angle Frog
The angle formed by intersecting gauge lines of a frog.

Angle Switch
The angle between the gage lines of the switch rail at its point and the stock rail.

Annunciator Panel
A device designed to monitor and indicate the status of detection circuits.

Antenna
A device designed to monitor and indicate the status of detection circuits.

Anthropomorphic Test Device (ATD)
Also known as a crash test dummy, this device is a biofidelic representation of a human body, which is used to assess the risk of injury under simulated collision conditions.

Anti-Climber
A structural member located at each end of the vehicle, used to engage the anti-climber of an opposing or other coupled vehicle to resist relative vertical travel between the two car bodies during a collision. In articulated vehicles, the articulation system is designed to act as an anti-climber.

Anti-climbing Mechanism[11]
The parts at the ends of adjoining vehicles in a train that are designed to engage when subjected to large buff loads to prevent the override of one vehicle by another.

Anti-creeper
A device attached to a railroad rail to keep it from moving longitudinally.

APC
Automatic Passenger Counter

Application Software
Software that defines the site-specific functions of a system, e.g., route locking.

Approach Circuit
A circuit generally used in connection with announcing the approach of trains at a block or interlocking station or to provide initial activation of a highway-rail grade crossing warning system.

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Approach Indicator
An indicator used to indicate the approach of a train.

Approach Locking
- Electric locking effective while a train is approaching a signal displaying an aspect to proceed, which prevents the movement of any interlocked or electrically locked switch, movable point frog, or derail in the route governed by the signal. Control is over a predetermined distance and incorporates a predetermined time release.
- An electric locking that is effective when a train is on the approach within a specified distance to a signal displaying an aspect to proceed that is set to stop and that which prevents the operation of any interlocked or electrically locked switch in the route governed by the signa and prevents an aspect to proceed from displayed for a conflicting route, until a predetermined time interval has expired or occupied or if the signal is at stop with the approach unoccupied.

Approach Signal
A fixed signal used in connection with one or more signals to govern the approach thereto.

Approach Slab
A concrete slab located at an aerial structure abutment or tunnel portal to provide a transition from direct fixation track to ballasted track.

Approach Stick Relay (ASR)
A vital interlocking relay used in an approach locking circuit.

AP-Style Bearing
A roller bearing assembly in which all the components are contained in a single unit. AP bearings contain two cone assemblies, a spacer rings between the cones to control axial clearance, a one-piece cup, and lubricant sealing systems at each end of the cup. Also known as an "AP-type" bearing or simply an "AP" bearing.

Arc
- An electrical locking that is effective when a train is on the approach within a specified distance to a signal displaying an aspect to proceed that is set to stop and that which prevents the operation of any interlocked or electrically locked switch in the route governed by the signal and prevents an aspect to proceed from being displayed for the conflicting route, until after a predetermined time interval has expired or occupied or if the signal is at stop with the approach unoccupied.
- An electrical spark that occurs when current jumps across and air gap as a result of a number of conditions. Arcing is a common electrical hazard.

Area
Multiple-use - a transportation right-of-way used for other purposes in addition to transportation, for example, as a park.

Area Occupancy
In station and other facility design and in pedestrian movement, the area provided per person.

Armature
The part, usually revolving, of an electric motor or generator that includes the main current-carrying winding and in which the electromotive force (EMF) is induced.

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Arterial Highway[12] A major road for any form of motor transport.

Articulated
An arrangement of rail rolling stock where adjacent units share a common truck at their interface.

Articulated Rail Vehicle (Articulated Car)
- An extra-long rail vehicle with two or more bodies connected by joint mechanisms that allow bending in curves yet provide a continuous interior. Typically, the vehicle is 56-100 ft (1 7-33 m) long. It is very common on light rail transit systems but is also found on several rail rapid transit systems.
- Rapid transit cars with separate bodies that share a common center truck.
- Rapid transit cars in consist with two trucks on each car and bodies joined so that passengers can walk between the cars.

Aspect (See also Signal Aspect)
- The appearance of a fixed signal conveying an indication as viewed from the direction of an approaching train, or
- The appearance of a cab signal conveying an indication as viewed by an observer in the cab
- The display or presentation of a wayside signal that provides an indication viewed from the direction of an approaching train; the appearance of a cab signal conveying an indication as viewed by an operator in the cab.
- The visual appearance of a flag, lantern, or the lens of a wayside signal, as viewed from the direction of an approaching train or cab signal as viewed by an observer in the cab. An aspect conveys an indication.
- The appearance of a roadway signal conveying an indication as viewed from the direction of an approaching train; the appearance of a cab signal conveying an indication as viewed by an observer in the cab.[13]

Aspect, False Clear
The aspect of a signal that conveys an indication less restrictive than intended.

Aspect, False Restrictive
The aspect of a signal that conveys an indication more restrictive than intended.

Aspect, Signal
The display or presentation of a wayside signal that provides an indication viewed from the direction of an approaching train- the appearance of a cab signal conveying an indication as viewed by an operator in the cab.

Assignment, Traffic or Trip
The procedure by which the volume of travel on each individual component of the transportation system is estimated.

Association of American Railroads (AAR)
An industry group representing primarily the major freight railroads of North America.

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Assault
An unlawful attack by one person upon another.

Asynchronous network
A non-synchronized electronic system for controlling headways. The transit unit (car or train) position is not rigidly controlled as a function of time. The longitudinal control of the transit unit is independent of line traffic when it is not in close proximity to another transit unit but usually becomes a car-following procedure when transit units are close to each other.

ATC
Automatic Train Control

Attendant, Train
A transit employee on board a train in service whose principal duties are to oversee safety, provide required security, and to assist in emergency operations.

At Grade, Exclusive Right-of-Way (ROW)
At-grade track that cannot be crossed or entered by any other vehicle or pedestrian.

At Grade, Mixed and Cross Traffic
Includes alignments where rail vehicles and rubber-tire vehicles travel in the same lanes and alignments where pedestrians may freely cross the tracks at any point.

At Grade, with Cross Traffic
At-grade track that cannot be entered by non-rail traffic except at certain crossing points.

At-grade section
Roadbed, generally at the same level as the surrounding area, on which ballasted track is constructed.

Audible Signals
A signal conveyed by a horn, bell, whistle, or electronic alarm.

Audio Frequency Impedance Bond
A device of low resistance and low impedance to all frequencies to which it is not tuned, used with jointless audio frequency track circuits to couple inductively and confine the signaling energy to its own track circuit and equalize the return propulsion current between rails without impeding its flow.

Audio Frequency Track Circuit
Track circuit energized by electrical current in the audio frequency range.
A device that may use audio frequency carrier (s) to detect the presence of a train within the limits of the track circuit.

Audit Checklist
A list of items derived from the System Safety Program Plan that will be examined in detail during an audit. Each item on the checklist will be rated as either being in conformance with, or in exception to, the System Safety Program Plan.

Audit
Formal or official examination to verify an item or activity against an identified standard.

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Augmented Block Guidance Control System
An automated block control system for transit units (cars or trains) with short headways.

Authority[14]
The agency legally established and authorized to operate a fixed guideway passenger rail system. Sometimes also referred to as Rail Transit System (RTA) or Rail Transit Authority (RTA).

Authority Having Jurisdiction (AHJ)[15]
- An organization, office, or individual for enforcing the requirements of a code, or a standard, or for approving equipment, materials, an installation, or a procedure
- The organization with the legal responsibility for overseeing an investigation.
- The entity that defines the contractual (including specification) requirements for the procurement of the highway-rail grade crossing equipment. Also, the entity responsible for the maintenance and upkeep of the equipment.

Authorized Personnel
Rail transit system personnel (employed or contracted) who need to be aware of and adhere to, or monitor adherence to, applicable rules and procedures contained in general and specialized rulebooks.

Automated Guideway Transit
Also called personal rapid transit, group rapid transit, or people mover is an electric railway (single or multi-car trains) of guided transit vehicles operating without an onboard crew. Service may be on a fixed schedule or in response to a passenger activated call button.

Automated Stop Announcement
An automated system that announces upcoming stops.

Automatic
A term applied to a system, subsystem, or device which has the inherent capability to function without direct manual participation.

Automatic Air Brake[16]
A train brake that provides control of the brake on every vehicle in the train and is automatic to emergency stop in the case of loss of control. The train will automatically stop if the train becomes uncoupled, if brake pipe is ruptured, if a brake valve is opened by passengers or staff and if the compressed air supply fails.

Automatic Block Signal (ABS)
A system of governing train separation in which the signals are controlled by the trains themselves. The presence or absence of a train in a block is determined by a track circuit. If the circuitry fails, a restrictive signal is displayed.

Automatic Block Signal System
- A block signal system wherein the use of each block is governed by an automatic block signal, by the cab signal indicator of an automatic speed control system, or by both.
- A series of consecutive blocks governed by block signals, cab signals, or both, actuated by train movement or by certain conditions affecting the use of a block.

Automatic Cab Signaling
An automatic block signal system in which cab signals are provided.

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Automatic Car Identification (ACI)
A system providing positive recognition and the transmission of the individual number of a train automatically at specific line locations.

Automatic Coupler [17]
A device for automatically coupling railway rolling stock and for transmitting and cushioning the effect of longitudinal stresses generated as the train moves and stops, as well as in classification yard work. The device couples cars automatically when they come together in the yard and automatically resets the parts of the mechanism to the ready position for coupling after a train has been broken up; the automatic coupler can be set to act as a buffer when the cars are not required to couple upon coming together. Uncoupling is performed manually (but the worker does not have to get in between the cars).

Automatic Guideway Transit (AGT) System
A fixed guideway transit system designed to operate without an operator onboard the vehicle.

Automatic Interlocking
An interlocking controlled by circuit logic so that movements succeed each other in proper sequence without need for manual control.

Automatic Passenger Counter (APC)
An automated means of counting boarding and alighting passengers (e.g., treadle mats or infrared beams placed by the door).

Automatic Safety Switch
A switch, identified by a yellow switch stand, through which trains and engines may make trailing movements without previously aligning it by hand.

Automatic Signal
A cost-effective series of signals in automatic block signaling that detects track occupancy (by train or obstruction) through the use of electrical circuits that send a current through the track between signals and determines whether the circuit is closed, open, or shorted. A trains' metal wheels and axles will pass current from one rail to the other, thereby shunting the circuit. If the ABS system detects that the circuit is shorted it understands that something is occupying the block and "drops" the signals.

Automatic Speed Control System
A system so arranged that its operation will automatically result in the following: A full service application of the train brakes if, while operating under a speed restriction, the speed of the train exceeds the predetermined rate. The application will continue until the train is either brought to a stop, or under the control of the engineer, its speed is reduced to the predetermined rate.

Automatic Train Control (ATC)
- The system for automatically controlling train movement, enforcing train safety, and directing train operations. ATC must include automatic train protection and may include automatic train operation and/or automatic train supervision.
- A system that enforces speed restrictions and prevents exceeding speed restrictions by automatic brake applications; may additionally encompass automatic train operation, automatic train protection and automatic train supervision.
- A system consists of three control subsystems and a computerized Central Control Facility. The three control subsystems are Automatic Train Operation (ATO), Automatic Train Protection

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(ATP), and Automatic Train Supervision (ATS). Each performs its own particular functions independently of the other two to a certain extent. The operations of the three subsystems are coordinated through the computer at Operations Control Center to achieve an integrated system.

- A trackside system working in conjunction with equipment installed on the train, arranged so that its operation will automatically result in the application of the brakes to stop or control a train's speed at designated restrictions, should the operator not respond. The system usually works in conjunction with cab signals.
- The method and, by extension, the specific system for automatically controlling train movement, enforcing train safety, and directing train operations. Automatic train control includes three major functions: automatic train operation, automatic train protection, and automatic train supervision.

Automatic Train Dispatcher

A programmable device whose function is to dispatch trains on a predetermined schedule.

Automatic Train Operation (ATO)

- The subsystem within the automatic train control system that performs any or all of the functions of speed regulation, programmed stopping, door control, performance level regulation, or other functions otherwise assigned to the train operator.
- That subsystem within the ATC System which performs functions normally performed by the operator. These functions are regulation of acceleration rate, speed, rate of deceleration, programmed stopping, and door control in conjunction with Automatic Train Protection and the Train-to-Wayside Communication System.
- A system that handles start-up and acceleration to running speed, maintains route speed, stops the train smoothly and at proper platform position, and may automatically open the doors.

Automatic Train Protection (ATP)

- A system that maintains fail-safe protection against collisions, excessive speed, and other hazardous conditions through a combination of train detection, train separation, and interlocking.
- That subsystem within the ATC System which enforces safe operation of the system. It imposes speed limits both to maintain train separation and to operate trains in accordance with civil speed restrictions. At inter-locking, a TP ensures that train movement is permitted only when a route is available through the interlocking, and the switches are safely locked in position. In all cases where two or more trains request the use of a single segment of track or interlocking, the ATP prevents occupancy by more than one train.
- A system for enforcing safe train operation, speed control, over-speed protection, train separation, and train routing.

Automatic Train Stop (ATS)

- A trackside system that works in conjunction with equipment installed on the vehicle to apply automatically the brakes and ensure a full train stop at designated restrictions or on a dispatcher’s signal, should the train violate defined operating limits, or the operator not respond properly.
- A system in which the train is brought to a stop through automatic brake application if imposed restrictions are ignored.

Automatic Train Supervision (ATS)

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- The subsystem within the automatic train control system which monitors the system status and provides the appropriate controls to direct the operation of trains in order to maintain intended traffic patterns and minimize the effect of train delays on the operating schedule.
- The subsystem within the automatic train control system that monitors trains, adjusts the performance of individual trains to maintain schedules, and provides data to adjust service to minimize inconveniences otherwise caused by irregularities. NOTE – The ATS subsystem also typically includes manual and automatic routing functions.

Automatic Transfer Switch

An electrical switching device that automatically switches over to the alternate source of power without interruption of ac power if the normal source of power drops off or drops under prescribed voltage levels. The transfer switch will automatically switch to its normal source of power after a pre-determined amount of time and a prescribed voltage level is restored to the normal side of the transfer switch.

Automatic Vehicle Location (AVL)

Position determination via an automatic technology or combination of technologies, such as Global Positing System (triangulation of satellite signals), Signposts (beacons at known locations transmit signals picked up by vehicle), Ground-Based Radio (triangulation of radio tower signals), or Dead-Reckoning (vehicle's odometer and compass used to measure new position from previous know position), and typically includes real-time reporting of that location to a dispatcher.

Automatic Vehicle Location System (AVL)

A system that senses, at intervals, the location of vehicles carrying special electronic equipment that communicates a signal back to a central control facility. AVLs are used for detecting irregularity in service and are often combined with a computer-aided dispatch system.

Automatic Vehicle Monitoring System (AVM)

A system in which electronic equipment on a vehicle sends signals back to a central control facility, locating the vehicle and providing other information about its operations or about its mechanical condition.

Auto-Tension System

A system tensioned by weight or spring to maintain an overhead contact system wire height and a constant wire tension within a defined temperature range.

Auxiliary Power System

- An on-board source of electrical power, normally used on multiple unit equipment, used under normal operating conditions to supply such functions as lighting, air conditioning, etc.
- An onboard source of electrical power (e.g., alternator/generator/car battery) typically used under normal operating conditions to supply such functions as lighting and air conditioning.

Availability

The probability that a system or system element will be operational when required. Mathematically, the ratio of the mean time between failure to the sum of mean time between failure plus mean down time.

Average Ambient Temperature

The average of temperature readings taken every three hours for a 24-hour period immediately preceding the work.

Average Braking Rate

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The rate obtained by dividing the speed at which the brakes are initiated (brake entry speed) by the elapsed time until stopped. The average braking rate does not include operator reaction time.

Average Passenger Load

The average number of passengers aboard a vehicle at any one time for its entire time in revenue service including late night and off-peak hour service as well as peak rush hour service

Average Speed

The speed of a vehicle is the miles it operated in revenue service divided by the hours it is operated in revenue service.

Average Trip Length

The average distance ridden for an unlinked passenger trip (UPT) by time period (weekday, Saturday, Sunday) computed as passenger miles traveled (PMT) divided by unlinked passenger trips (UPT). May be determined by sampling or calculated based on actual data.

Average Weekday

A typical, representative weekday in the operation of the transit system, weighted to reflect seasonal variations in service, ad not including atypical days.

Average Weekday Unlinked Passenger Trips

The number of passengers who board public transportation vehicles on an average, typical weekday during a month.

AVL

Automatic Vehicle Location

AWG

The American Wire Gage is used almost exclusively in the USA as a unit for sizing wire.

AW Passenger Weight Loadings

The following is based on a passenger weight of 155 lbs. (70.3 kg.) per person

- **AW0**: Ready to Run: Empty car weight (without train crew).
- **AW1:** Service Load. AW0 + fully seated load + train crew.
- **AW2:** Design Load. AW1 + standees at one person per 2.7 sq. ft. (four people per m^2)
- **AW3:** Crush Load. AW2 + standees at one person per 1.79 sq. ft. (six people per m^2).
- **AW4:** Structure Design. AW3 + standees at one person per 1.35 sq. ft. (eight people per m^2)

Axial Femur Load Criterion

Peak axial femur load (Fz), filtered at CFC600.

Axial Neck-Load Fz

Neck injury criterion indicating maximum allowable axial tension/compression force measured at the upper neck load cell.

Axle Counter

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An automatic arrangement for detecting and counting car and locomotive axles that pass a given wayside location; usually makes use of a wheel detector.

B

Backup
An alternate means of accomplishing a function using software, hardware, circuits or operational procedures separate from those used for the primary method.

Backup Battery
The battery source that is part of the CCD and is used to power the system when the trainline power and the local car battery power are not present.

Backup Operations Control Center (BOCC)
A location separate from the OCC that allows an RTA to have the same or similar operability if the OCC is not functional.

Backup System
A redundant system that performs the principal functions of the primary system with minimum deviation from the performance of the primary system.

Ballast
- Material placed on a track bed to support and restrain the track, and to provide drainage. Suitable material consists of hard particles (e.g., crushed rock, slag, gravel) that are stable, easily tamped, permeable, and resistant to plant growth.
- Granular material placed in the track bed to support and restrain the track in line and surface.
- Specified material placed on the track bed to support and restrain the track.

Ballast Dressing
The work required to fill ballast in tie cribs, shaping and regulating the ballast berms to a uniform cross section and sweeping the ballast from the top of the ties.

Ballast Impedance
The impedance shunting a track circuit due to the condition of the ballast.

Ballast Leakage
The leakage of current from one rail of a track circuit to the other through the ballast, ties, etc.

Bar Order
- A notice that a transit unit or locomotive needs repair.
- A defect in a device or a transit unit or locomotive needing repair.

Bar Signal
An illuminated signal configured in the shape of a bar, normally positioned to appear in a vertical, angled or horizontal orientation. These are used as aspects to convey a signal indication. Bar signals are often used on light rail transit systems.

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Base Period
In transit, the time of day during which vehicle requirements and schedules are not influenced by peak-period passenger volume demands (e.g., between morning and afternoon peak periods). At this time, transit riding is fairly constant and usually low to moderate in volume when compared with peak-period travel.

Base Period Fleet
In transit, the number of transit units (vehicles or trains) required to maintain base-period schedules.

Baseline Measurements
Measurements which are taken when a track circuit is commissioned or readjusted after repair or modification.

Baseline Noise and Vibration Signature
The displacement response frequency from vibrations generated by mechanical rolling and sliding contact. Vibration characteristics can be recorded by plotting the displacement amplitude and frequency or when in an audible range, by characteristic sounds. The baseline signature is a record of the characteristics recorded from a new, rebuilt, or pre-determined, known serviceable truck and is used as the basis for comparison.

Basic Operating Unit
In rail rapid transit, the smallest number of rapid transit vehicles that can operate independently in revenue service, usually one to three (exceptionally more) cars.

Batter
The deformation of the surface of the head of the rail in the immediate vicinity of the end.

Battery
A device that converts chemical energy to electrical energy.

Battery Cell
A unit contained in a battery that produces a direct voltage by converting chemical energy to electrical.

Battery String Voltage
The total output voltage measured across a group of interconnected batteries.

Battery Terminal
A piece of conductive material used as a point of connection on a battery for attaching the positive or negative leads of a device.

Battery Terminal Voltage
The total voltage measured between the positive and negative battery terminals.

Belt Rail
A continuous or effectively continuous longitudinal framing member or longeron in the side frame at approximately mid-height. In side frames with normal passenger side window openings, the belt rail is typically immediately below the windows where it also serves as part of the framing for the window openings.

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Beneficial Use
When the elevator is placed into service, which may be prior to the site being ready for public use.

Berth, Train
The space designated for a train of given length to occupy when it is stopped at a station platform, in a terminal, on a transfer track, or at some other designated place.

Bi-Directional Transit Unit
A transit unit moving or operating in two usually opposite directions.

Bi-Folding Door
A door with hinged panels that in the open position fold against the door bulkhead.

Bi-Parting Door
A door, usually sliding, that has two panels that open from the center and are normally synchronized.
Manual operation: a door capability that permits operation by hands without tools or keys.

Blended Brake
The coordinated combination of two or more modes of braking (e.g. dynamic brake and friction brake) to produce the desired total retarding effort.

Blinker Door
- Door panel pairs that rotate into the entryway or stepwell when opened.
- Bi-parting doors that swing inwards and to the sides of the door opening.

Block
- A length of track of defined limits, the use of which by trains is governed by block signals, cab signals, or both.[18]
- A section of track of defined limits, the trains' entrance to which is governed by block signals, cab signals, both, or by other written or verbal authority as prescribed by rule.
- A continuous section of track of defined limits, the use of which by rolling stock is governed by an ATC or wayside signals or both. A block may contain one or more track circuits.
- A section of track or guideway of defined limits on which the movement of trains is governed by block signals, cab signals, or both; also known as a signal block.
- A section of track of defined length, the occupancy of which is regulated by fixed signal(s), telephone or radio orders, or timetables-, also known as a block section.
- A length of track of defined limits, the use of which by trains and engines is governed by block signals, block-limit signals, automatic speed control, or any combination thereof.
- A length of track of defined limits, the use of which is governed by block signals, cab signals, or both, or other set procedures.
- The daily operating schedule of a transit unit (vehicle or train) between pull-out and pull-in, including scheduled and deadhead service. A block may consist of a number of runs.

Absolute
- A block which no train is permitted to enter while it is occupied by another train.[19]

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- A section of track between two specific locations into which no train is permitted to enter while that section is occupied by another train. This absolute block is established and governed by the Operations Control Center (OCC) when necessary, due to a car borne malfunction (e.g., ATP or Braking) or ATC failure.

Automatic
A series of consecutive blocks governed by block signals, cab signals, or both, actuated by train movement or by certain conditions affecting the use of a block.

Fixed
An automatic train control system that records the presence of a train (or a part of it) in each track section (block) and activates the signals on the line to indicate the block is occupied. In some cases, a following train is prevented from entering the block by a forced emergency stop.

Indicator
A device generally located near a turnout switch, that is used to indicate the presence of a train in the block or blocks leading to that switch.

Limit Signal
A fixed signal indicating the limit of a block, the use of which by trains is prescribed by manual block signal system rules.

Limit Station
A place at which a block-limit signal is displayed.

Manual
- A block signal system operated manually, usually based on information communicated by telegraph or telephone.
- A system of manually governing train movement in a block or a series of consecutive blocks by means of signals, train orders, telephone, or radio.

Mileage
The distance traveled daily during the operating schedule of a transit unit (vehicle or train) from pull-out to pull-in, including scheduled and deadhead service.

Moving (Dynamic Block Control)
An automatic train control system that spaces trains according to their location and (sometimes) their relative velocity, stopping performance, and a prescribed factor of safety.

Occupancy
The presence of a train in a track circuit or block or the resultant state achieved by shunting the rails of the track circuit.

Permissive
- A block which permits a train to enter while it is occupied by another train.
- A signal system for a single track or guideway that prevents simultaneous opposing train movements between sidings but permits following movements at a safe distance.

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Signal
A fixed signal installed at the entrance to a block to govern trains entering and using that block.

Signal System
A method of governing the movement of trains into or within one or more blocks by block signals or cab signals.

Station
A place at which manual block signals are displayed.

Boarding
To embark on a vehicle.

Boarding, Level
Boarding from a platform that is at the same level (or slightly lower) as the low floor portion of the vehicle. Used to improve accessibility and speed boarding, especially for passengers using wheelchairs or other mobility aids, as well as passengers with strollers or carrying belongings.

Boarding, Fully-Level
Boarding from a platform that is at the same level as the vehicle's low-floor section (typically 14 inches).

Boarding, Near-Level
Boarding from a platform that is slightly lower (typically 3-6 inches) than the vehicles' low-floor section. A bridge plate is provided as a boarding aid at the vehicle's accessible doorways.

Body Belt[20]
A strap that can be secured around the waist or body and attached to a lanyard, lifeline, or deceleration device.

Body Harness[21]
A device with straps that is secured about the person in a manner so as to distribute the fall arrest forces over (At least) the thighs, shoulders, pelvis, waist, and chest and that can be attached to a lanyard, lifeline or deceleration device. bridge

Body Hoist
Apparatus, either electro-mechanical or hydraulic, generally used in conjunction with truck hoists, for maintaining a vehicle car body elevated. Often called body supports. Installation is part of shop track system.

Bolted Fastener System
Any fastener system containing a bolt (exclusive of anchor bolts) to hold the elastic rail clip in position.

Bomb Threat
Credible written or oral (e.g., telephone) communication to a transit agency threatening the use of an explosive or incendiary device for the purpose of disrupting public transit services or to create a public emergency.

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Bond, Impedance
An iron core coil of low resistance and relatively high reactance used to provide a continuous path for the return propulsion current around insulated joints and to confine the alternating current signaling energy to its own track circuit.

Bond, Inductive Coupled Impedance
A device of low resistance and high reactance used with jointless audio frequency track circuits to couple inductively and confine the signaling energy to its own track circuit and equalize the return propulsion current between rails without impeding its flow.

Bond, Propulsion
A conductor of low resistance providing a path for the return propulsion current at non-insulated joints.

Bond, Rail joint [22]
A metallic connection attached to adjoining rails to insure electrical conductivity.

Bond, Signal
A conductor of low resistance providing a path for track circuit current across bolted rail joints.

Bonded Fastener
A resilient fastener in which the elastomeric material is bonded to steel top plate and a steel bottom plate. A common manufacturing practice is to apply an adhesive to the steel plates, place plates in the mold with the compounded but uncured elastomer, and then conduct the elastomer curing. Bonding and curing occur in the same process.

Bonded Joint
A rail joint that uses high-strength adhesives in addition to bolts to hold the rails together.

Bonding
The establishment of a low-impedance current path between two adjacent components through an intimate interface surface.

Bonding (Rail)
The connection of rails or frogs to provide a continuous path for signal or propulsion current by use of bonds.

Book of Rules
A set of codified regulations and procedures by which operating personnel are governed.

Brake
Air
A brake in which the mechanism is actuated by manipulation of air pressure.

Actuator
A self-contained brake system component that generates the force to apply the brake shoe or brake pad to the wheel or disc.

Automatic air
A brake in which air is stored above atmospheric pressure so that a reduction in pressure in the brake line (intentional or by some failure) causes a valve in each rail car to use air from an auxiliary reservoir to build up pressure in the brake cylinder, thus applying the brakes.

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Car Control Device (CCD)
The CCD is an electronic control device that replaces the function of the conventional pneumatic service and emergency portions during electronic braking and provides for electronically controlled service and emergency brake applications. The CCD interprets and acknowledges the electronic signals and controls the service and emergency braking functions on the car. In a stand-alone system, the CCD also controls reservoir charging. The CCD also will send a warning signal to the locomotive in case any of the components cannot respond appropriately to a braking command. Each CCD has a unique electronic address that is keyed to car reporting marks and number. A CCD shall be activated by presence of train line power. Each CCD contains a battery, which is charged from train line power. There are a number of different types of CCD applications:

Overlay brake system
An overlay ECP brake system is capable of operating in either conventionally or electronically braked train. A failure of the CP overlay brake system would enable a train to continue to operate as a conventionally braked train using conventional control valve when the ECP brake system is placed in cutout mode and train operation continued with the pneumatic brake. When operating in the electronic mode, an overlay system is pure ECP brake system must operate identically, as specified in forthcoming Sections of this standard.

Emulator CCD
A CCD may optionally emulate the function of the pneumatic control valve while in a conventionally brake train. A suitable power source shall be provided to allow the emulator CCD to function as specified at all train speeds for a minimum of 48 hours. The functions and performance of pneumatic brake emulation must adhere to the requirements of AAR Standards S-461, S-462, S-464, and S-467.

Stand-alone CCD
A CCD that cannot operate in a conventional pneumatically braked train and must operate only in ECP equipped trains.

Continuous (trainlined brake)
A system of brakes inter-connected among rail cars so that the brakes on all cars in the train can be operated simultaneously from the locomotive or from any car in a multiple-unit train.

Control Unit - A device that controls and transmits pressure to brake units in response to control commands.

Cutout
A device which releases the brakes of a vehicle or portion thereof**.**

Cylinder
A cylinder in which compressed air acts on a piston that transmits the force of the compressed air to the associate brake rigging**.**

Disc

- A brake used primarily on rail passenger cars that uses brake shoes clamped by calipers against flat steel discs.
- A circular solid or finned plate that is rotating with respect to the disc brake pads that are brought into contact with it to provide the retarding force. Usually mounted to the wheel, hub, or axle. Also known as a friction ring.
- A retardation system used on some rail vehicles, primarily passenger equipment, that utilizes flat metal discs as the braking surface instead of the wheel tread.[23]

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- A means of retardation used on some rail vehicles that utilizes flat metal discs as a braking surface. The disc is clamped by brake pads through a caliper arrangement.

Dynamic (electric brake, electrodynamic brake, motor brake)
A system of electrical braking in which the traction motors, used as generators, retard the vehicle by converting its kinetic energy into electrical energy. This energy is absorbed by suitable resistors. Dynamic brakes may be used to control train speed and to brake a train to a low speed, after which air brakes may bring the train to a full stop. See also BRAKE, Regenerative.

Electric[24]
A mode of operation of the propulsion system in which retarding is provided.
NOTE: Although generally considered synonymous with dynamic brake, electric brake is a more global term, in that it includes the possibility of providing retardation by drawing power from the line or other means not dependent on conversion of kinetic emergency into retarding power, which is the key element of dynamic braking.

Electro-pneumatic (pneumatic brake)
An automatic air brake that has electrically controlled valves to expedite applying and releasing the brakes.

Emergency
Fail-safe, open-loop braking which bring the train to a complete stop with an assured stopping distance considering all relevant factors. Once the brake has been initiated, it is irretrievable, i.e. it cannot be released until the train has stopped or a predetermined time has elapsed.

Friction (mechanical brake)[25]
A braking system that presses brake shoes against the running wheel tread or pads against inboard or outboard disc surfaces

Hand

- A braking device manually applied to an already stopped train to prevent rolling.
- A brake that can be applied and released by hand to prevent movement of a rail car.

Panic
A form of braking, regardless of whether it is fail-safe or not, to provide the shortest possible stopping distance.

Parking
A brake that is applied to a vehicle to ensure the vehicle remains in a no-motion state.

Penalty
One of the functions of the automatic train protection portion of the master control system which causes the train to go into a safety critical full-service or emergency brake application.

Regenerative
A form of dynamic brake in which the electrical energy generated by braking is returned to the power supply line instead of being dissipated in resistors.

Rheostatic
A form of dynamic brake in which the electrical energy generated by braking is dissipated as heat in on-board resistors during the braking cycle.

Service Application

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A nonemergency brake application that obtains the maximum brake rate that is consistent with the design of the brake system and is retrievable under the control of the master control.

Snow
Means of applying a light brake cylinder pressure on a vehicle to prevent the accumulation of ice and snow between the friction material and the braking surface.

Track (electromagnetic brake, magnet brake)
A brake that consists of electromagnetic plates suspended above the track rail between the two axles of a truck. When the brake is activated, the plates drop onto the rails and exert braking by using powerful magnetic force that causes friction. The brake cannot be applied gradually and is used for emergency and holding, generally in conjunction with another braking system. This type of brake is required on all light rail vehicles and most streetcars.

Disc

- A circular solid or finned plate that is rotating with respect to the disc brake pads that are brought into contact with it to provide the retarding force. Usually mounted to the wheel, hub, or axle. Also known as a friction ring.
- A retardation system used on some rail vehicles, primarily passenger equipment, that utilizes flat metal discs as the braking surface instead of the wheel tread.[26]
- A means of retardation used on some rail vehicles that utilizes flat metal discs as a braking surface. The disc is clamped by brake pads through a caliper arrangement.

Disc Pad
A replaceable friction element secured to a brake head for the purpose of producing a retarding force onto the face of a disc.

ECP
The electronically controlled pneumatic brake system power supply is a DC supply operating at nominally 230 Vdc to provide electrical power, via the train line, to all connected car control devices and end of train devices. The power supply is mounted within a locomotive and is controlled by a power supply controller (PSC), which is a network device. The power supply shall meet the requirements of AAR Standard S-4220, "ECP Cable-Based Brake DC Power Supply—Performance Specification," latest revision. A single power supply shall be capable of supplying power to an ECP-equipped train consisting of a minimum of 160 CCDs and an EOT.

Effective[27]
A brake that is capable of producing its required designed retarding force on the train. A brake is not effective if its piston travel is in excess of the maximum prescribed limits.

Head
A holder which carries the detachable brake shoe or brake pad.

Inoperative[28]
The primary brake, for whatever reason, no longer applies or releases as intended or is otherwise ineffective.

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Horsepower
The mechanical crankshaft output of the diesel power plant, equal to traction horsepower plus auxiliary load horsepower.

Parking[29]
A brake that can be applies and released by hand to prevent movement of a stationary rail car or locomotive.

Pipe[30]
A pipe running from the engineman's brake valve through the train, used for the transmission of air under pressured to charge and actuate the automatic brake equipment on each vehicle of the train.

Pipe Pressure
Air pressure that exists in a system of piping (including branch pipes, angle cocks, cut-out cocks, dirt collectors, hoses and hose couplings) used for connecting locomotives and all cars for the passage of air to control the locomotives and car air brakes.

Primary[31]
Those components of the train brake system necessary to stop the train with the signal spacing distance without thermal damage to friction braking surfaces.

Secondary
Those components of the train brake system which develop supplemental retarding force that is not needed

Shoe
The non-rotating portion of a tread or disc brake assembly. The shoe is pressed against the tread, disc, or drum when the brake is applied.

Shoe Key
A key by which a brake shoe is fastened to a brake head.

Application
The application of braes to achieve the desired rate of either service deceleration or emergency deceleration.

Full Service Application[32]
An application of the brakes resulting from a continuous or a split reduction in brake pip pressure at a service rate until maximum brake cylinder pressure is developed. As applied to an automatic or electro pneumatic brake with speed governor control, an application other than emergency which develops the maximum brake cylinder pressure, as determined by the design of the brake equipment for the speed at which the train is operating.

Applied
An indication that all friction brakes are applied to some agreed upon preset level.

Blended
A braking system where the primary brake and one or more secondary brakes are automatically combined to stop the train. If the secondary brakes are unavailable, the blended brake uses the primary brake alone to stop the train.[33]

Closed Loop

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Braking under continuous direction of the train control system.

Maximum Service (full service braking)
In rail operations, a non-emergency brake application that obtains the maximum brake rate that is normally regarded as comfortable for passengers and consistent with the design of the primary brake system.

Open-loop
Unmodulated braking without feedback control from the train control system.

Service (service application)
In rail operations, retardation produced by the primary train braking system at the maximum rate of retardation regarded as comfortable for repeated use in service stopping.

Distance
The maximum distance on any portion of any railroad which any train operating on such portion of railroad at its maximum authorized speed, will travel during a full-service application is initiated and the point where the train comes to a stop.

Dynamic

- An electric primary braking system whereby the current derived from the motors, acting as generators, is modulated to provide controlled braking.
- A means of train braking whereby the kinetic energy of a moving rail vehicle(s) is used to generate a current at the traction motor, which is then dissipated through banks of resistor grids (resistive brake) or back into the catenary or third rail system (regenerative brake). In a hydraulic transmission arrangement, a hydrostatic brake is the dynamic brake.

Emergency
An irrevocable open-loop braking system designed to insure fail safe brake application. An irrevocable open-loop braking to a stop at the maximum brake rate the system is capable of applying.

Effort
The longitudinal retarding force generated by the friction brake system or the propulsion system (in electric brake).

Full Service
A non-emergency brake application which obtains the maximum brake rate consistent with the design of the primary brake system(s).

Indicator
A device, actuated by brake cylinder pressure, which indicates whether brakes are applied or released.

Inoperative
A primary brake that, for any reason, no longer applies or releases as intended or is otherwise ineffective.

Operative
An operative brake is an individual brake set that is fully functional. One brake set is two braked trucks.

On-tread Friction
A braking system that uses a brake shoe that acts on the tread of the wheel to retard the vehicle.

Open Loop

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Braking without feedback control.

Parking
A brake that can be applies and released by hand to prevent movement of a stationary rail car or locomotive.

Penalty

- A function of automatic train protection portion of the master control system accomplished by a safety critical full-service or emergency brake application.
- Although most commonly associated with an overspeed operating condition, penalty brake initiated for a variety of reasons, depending on the vehicle design and the requirements of authority having jurisdiction.

Pipe
The system of piping used for connecting locomotives and all rail cars for the passage of air to control the locomotive and car brakes.

Programmed
Closed-loop braking with the requirement that a stop be completed at a designated point within a specified distance.

Average Rate
The rate obtained by dividing the speed at which the brakes are initiated (brake entry speed) by the elapsed time until stopped. The average braking rate does not include operator reaction time.

Rate
The negative time rate of change of speed of vehicle as produced solely by the action of its braking system(s).

Service
Retardation produced by the primary train braking system.

Shoes (or pads aligned with tread or disc)
The surface of the brake show or pad, respectively, engages the surface of the wheel tread disc, respectively, to prevent localized thermal stress.

System
Those elements on board a train and their interconnections that produce speed retardation in response to a control signal.

- **Blended**
  A braking system where the primary brake and one or more secondary brakes are automatically combined to stop the train. If the secondary brakes are unavailable, the blended brake uses the primary brake alone to stop the train.[34]

Tread

- A means of retardation used on some rail vehicles that utilizes brake shoe that is pressed against the wheel tread.
- A braking system that uses a brake shoe that acts on the tread of the wheel to retard the vehicle**.**

Valve
A separate operator's control for the purpose of applying and releasing pneumatic friction brakes

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Breakdown
An inability to perform an intended function.

Bridge
A structure built to span physical obstacles including, but not limited to a body of water, a valley, a road, or railway, for the purpose of providing passage over the obstacle.

Bridge, ballasted
A bridge on which ballasted track is constructed.

Bridge, non- ballasted
A bridge having a steel or concrete surface on which direct fixation track is constructed.

Bridge Plate
A manual or automatic retractable ramp on the low-floor vehicles which is used as a boarding assistance device in conjunction with a near-level platform.

Bridge Tie
A transverse timber resting on the stringers and supporting the rails.

Brightness Ratio
The ratio of the light level in one area with respect to the light level in another area.

Brush
A conductor serving to provide, at a rotating surface, electrical contact with a part moving relative to the brush.

Brush holder
A structure designed to carry a brush or brushes that enables it to be maintained in contact with a sliding surface.

Buckling Incident
The formation of a lateral mis-alignment sufficient in magnitude to constitute a deviation from the Class 1 requirements specified in §213.55 of this part. These normally occur when rail temperatures are relatively high and are caused by high longitudinal compressive forces.

Buffer
A spring assembly, gas-hydraulic self-resetting absorption device, crush cartridge assemblies, or series of elastomeric elements within some couple assemblies, which can absorb a high-impact coupling or severe buff loads.

Buffer Spring
A spring used to cushion or absorb shock to prevent damage to the gear train when the stop trip arm is driven to the clear position.

Bumping Post
A device attached to the rail designed to stop a rail vehicle at the end of a track.

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Bumping Post Signal
A signal to advise that a bumping post at a temporary or permanent end of the track is ahead.

Bunching
With transit units, a situation that occurs when passenger demand is high and dwell times at stops are longer than scheduled. Headways become shorter than scheduled, and platoons of transit units develop, with longer intervals between platoons. The same effect (one transit unit caught by the following) can also be caused by lack of protection from general road traffic congestion or by traffic signal timing. Bunching can become cumulative and can result in delay to passengers and unused capacity.

Burn-In
A conditioning procedure involving the operation of items in specified environmental conditions for the purpose of eliminating early failures by aging or stabilizing the items prior to operational use.

Burrs
The rough edges left at the end of a rail when sawed; or on the side of the web when drilling bolt holes.

Buss Voltage
The voltage measured at an interconnect point for a power source.

Bypass
A device designed to yard a function.

Bypass Mode
A specific system operating condition wherein the standard system outputs and operations are disabled.

C

Cab
The space or compartment in a locomotive or a powered rail car containing the operating controls and providing shelter and seats for the engine crew or train operator.

Cab Car
The cab car provides controlling functions to remotely operate a trail locomotive and to provide braking and traction commands. The ECP components of a cab car include elements of both HEU and CCD functionality.

Cab Signal
- A signal in the train operator's cab that conveys either automatic block aspects or indicates the prevailing speed command, or both.
- In rail systems, a signal located in the cab, indicating a condition affecting the movement of a train and used in conjunction with interlocking signals and in conjunction with or in lieu of block signals.

Cab Signal Indicator

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A signal indicator located in the engine control compartment displaying the maximum speed for the movement of a train, used in conjunction with interlocking signals and either in conjunction with or in lieu of block signals.

Cab Signal Mode
A form of manual train control wherein the operator controls the speed of the vehicle in accordance with signal aspects displayed on the cab signal indicator.

Cab Signal System
Electrical/electronic system interfaced with the trackside equipment to display the authorized speed to the Operator and, if applicable, to provide authorized speed to the Automatic Train Control (ATC) System.

Calendar Day Inspection
An inspection performed each calendar day as prescribed by 49 CFR, Parts 229, and 238.

Calibration
1. Reconciliation of an instrument with an established standard.
2. In modeling, the procedure used to estimate the parameters of a model or to adjust a model to replicate actually measured conditions.

California Public Utilities Commission General Order 143-B
A set of rules and regulations issued to establish safety requirements governing the design, construction, operation, and maintenance of light-rail transit systems in the state of California.

Caliper
The assembly on disc brakes which hold the disc pads and straddles the disc.

Call-On
A signal aspect that requires the train operator to bring a train to a complete stop before proceeding into an occupied block at restricted speed.

Cam
A machine part with an irregular form such that its motion, usually rotary, imparts by contact to another part, specific reciprocating motion.

Cam Controller
A device to regulate direction, accelerating, running, and braking of an electric vehicle. Cams on a rotating shaft open or close spring-loaded contacts that make or break electric circuits between the power supply and the traction motors.

Candela (cd)
A unit of luminous intensity in both the SI and English measurement systems. One candela is 1 lumen per steradian (lm/sr). It is similar to the obsolete unit called the candle.

Cant
The inward inclination of a rail, effected by the use of inclined-surface tie plates, usually expressed as a rate of inclination, such as 1 in 40, etc.

Capability
The ability of equipment or systems to perform an intended task when in a non-failed state.

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Capacity Exit Factor (CXF)
A value equal to the seating capacity of the car divided by 17 rounded up to the next whole number.

Capacity, Line
The number of vehicles per unit time, or passengers per unit time, that flow in one direction between two points along a line.

Capacity Rated
The ability of the battery to deliver a stated current for a stated time under stated conditions; measured in ampere-hours.

Capacity, Vehicle
The passenger capacity pertinent to specified loading conditions.

Capital Inventory
That class of inventory which, by rebuild, can be returned to specified operating condition rather than consumed.

Car
- Car is defined as a passenger carrying rail vehicle.
- Defined as a unit of passenger rolling stock.
- Rail vehicles are often referred to as "cars".
- Any unit of equipment designed to be hauled by locomotives, or any unit of on-track work equipment such as a track motorcar, a highway-rail car, on-track push car, on- track crane, on-track ballast tamping machine, etc.

Cable Car
An individually controlled rail passenger vehicle operating in mixed street traffic and propelled by gripping a continuously moving cable located in an underground slot between the rails. The cable (which can draw many cable cars simultaneously) is powered by a large stationary motor at some central location instead of aboard the vehicle.

Car Body
In passenger transportation, that portion of a rail car that carries people.

Double-deck
A bi-level rail car with a second level that covers the full width of the car but may or may not extend the full length.

Dual-powered turbo-electric
A commuter railroad car capable of either running on electric power from a third rail or overhead wire or self-propulsion by a generator driven by a gas turbine.

Electric rail
A rail car powered by current from a conduit along the track. The conduit is usually an overhead wire or third rail. See also CAR, Rectifier electric motor.

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Gallery
A bi-level rail car that has seating and access aisles on a second level along each side of an open well. Tickets of passengers on the second level can be inspected or collected from the lower level.

Light rail LRV, light rail vehicle)
A rail vehicle similar to a streetcar. It may be larger, however, and is often articulated. A light rail car is capable of boarding and discharging passengers at either track or car-floor level.

Multiple-unit (MU)
A powered rail car arranged either for independent operation or for simultaneous operation with other similar cars, when connected to form a train of such cars. It may be designated as DMU (diesel multiple-unit) or EMU (electric multiple-unit), depending on the source of power.

Rail diesel (RDC, diesel rail car)
A self-powered rail car that usually has two diesel engines and can usually operate in multiple units (diesel multiple-unit car).

Rail motor (motor car, powered car, self-powered car, self-propelled car):
A rail car that is propelled by a motor or engine located on the car itself. It can often be operated in multiple units (multiple-unit car). Common types are electric (electric rail car), which receives current either from a third rail or from an overhead wire, and diesel (rail diesel car).

Rail rapid transit (rapid transit car, subway car)
A rail car for rapid transit systems. It is bi-directional, usually powered, and equipped with a control cab at one or both ends. It may be designed to operate in single or multiple units. It has two to five double doors per side, designed for fast boarding and alighting from high-level platforms.

Rectifier electric motor
A rail car that collects propulsion power from an alternating-current distribution system and converts it to direct current for application to direct current motors by means of rectifying equipment carried by the rail cars. The car may be defined by type of rectifier used, for example, ignitron electric car.

Single-unit (SU)
A powered rail car, equipped with a control cab at one or both ends, that operates alone.

Track
A self-propelled rail car (e.g., burro crane, highway rail car, detector car, weed burner, tie tamper) that is used in maintenance service and that may or may not operate signals or shunt track circuits.

Trolley
- A local term for a streetcar.
- Recently, also a local term for a bus with a body simulating that of an old streetcar.

Car Body
- The basic metallic structure of the rolling stock.
- The portion of a car that carries people and all equipment except the truck assemblies.

Car Builder
- General term for a supplier of complete rail transit vehicles.
- The entity assembling or manufacturing the vehicle.

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Car Carried Relay
A relay installed on transit cars.

Car Control
For purposes of this recommended practice, car control is those train-lined communication functions associated with locomotive-hauled passenger cars, e.g. door control, public address, etc.

Car Control Device (CCD)
The CCD is an electronic control device that replaces the function of the conventional pneumatic service and emergency portions during electronic braking and provides for electronically controlled service and emergency brake applications. The CCD interprets and acknowledges the electronic signals and controls the service and emergency braking functions on the car. In a stand-alone system, the CCD also controls reservoir charging. The CCD also will send a warning signal to the locomotive in case any of the components cannot respond appropriately to a braking command. Each CCD has a unique electronic address that is keyed to car reporting marks and number. A CCD shall be activated by presence of train line power. Each CCD contains a battery, which is charged from train line power. There are a number of different types of CCD applications:

Overlay brake system – an overlay ECP brake system is capable of operating in either conventionally or electronically braked train. A failure of the CP overlay brake system would enable a train to continue to operate as a conventionally braked train using conventional control valve when the ECP brake system is placed in cutout mode and train operation continued with the pneumatic brake. When operating in the electronic mode, an overlay system is pure ECP brake system must operate identically, as specified in forthcoming Sections of this standard.

Emulator CCD – a CCD may optionally emulate the function of the pneumatic control valve while in a conventionally brake train. A suitable power source shall be provided to allow the emulator CCD to function as specified at all train speeds for a minimum of 48 hours. The functions and performance of pneumatic brake emulation must adhere to the requirements of AAR Standards S-461, S-462, S-464, and S-467.

Stand-alone CCD – a CCD that cannot operate in a conventional pneumatically braked train and must operate only in ECP equipped trains.

Car End Door
- A door exiting from the passenger compartment or vestibule to the exterior, located between the truck center and the end of the car, with a door threshold height not greater than 5 feet (1.52 cm) above top of rail.
- A door exiting from the passenger compartment or vestibule to the exterior, located between the truck center and the end of the rail car.

Car ID Module
Car-specific data shall be stored in a module on the car and provided to the CCD in such a way that the CCD always contains the correct characteristics, parameters (constants), and other information for the car or brake set on which it is placed. Therefore, car-specific data shall be mechanically tied to the car in such a way that it cannot be changed inadvertently in the field, even if CCDs are swapped. Format of the car specific data is given in AAR Standard S-4230, latest revision. The CCD shall maintain a copy of the car ID information. At a minimum, this information shall contain the following:

- Vehicle reporting mark
- AAR car type

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- Stretched length over pulling faces
- Loaded weight
- Empty weight
- Default full-service net braking ration (NBR)
- Braking constant “C”
- Reservoir constant “RC”
- Minimum brake application cylinder pressure
- Presence/type of pneumatic empty/load device
- Presence of electronic empty/load device
- Number of operable brakes controlled
- Number of axles associated with CD
- Vehicle orientation reference

Car Level
A horizontal surface with permanently installed seating that is separated by at least 4 feet (1.22 m) vertically from another seating area.

Car Spot
Single location within a shop or a yard of sufficient length and width to hold one car.

Carbon Steel
Steel containing only the elements carbon, manganese, phosphorus, sulfur and silicon in addition to iron; the properties of which are due essentially to the percentage of carbon in the steel.

Carbon Strip
The current collector strip mounted to the top of the pantograph, which slides along the contact wire.

Cartridge Fuse
A device used to protect an electric circuit from the effect of excessive current draw enclosed in an insulating cartridge.

Catastrophic
A hazard severity category identified as "Category I, Catastrophic". Category I is defined as failure conditions which could result in a large number of injuries and/or fatalities, and/or loss of system. For example, braking system loss at high speeds is considered a catastrophic hazard because it is assumed a collision could result. Single failures that result in catastrophic failure conditions are not acceptable.

Category of Equipment and Service
A particular, specified equipment design or group of designs with nearly identical fire-resistance and evacuation characteristics when taken in combination with the operating environment in which the equipment is used.

Catenary
An overhead wire from which a transit vehicle collects propulsion and auxiliary power.

Catenary System
That form of electric contact system in which the overhead contact wire is supported from one or more longitudinal wires or cables (messengers), either directly by hangers (simple catenary) or by hangers in combination with auxiliary conductors and clamps (compound catenary). Attachment of the contact wire to the messenger is made at frequent and uniform intervals to produce a contact surface nearly parallel to the top of the track rails.

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Cell
The smallest, indivisible unit of the battery; the fundamental electrochemical unit.

Cell Terminal
An external connection point on a battery cell of specific polarity.

Centering Device
A device that prevents or limits a free or uncouples coupler assembly from moving in its normal lateral range.

Central Control
The place where train control or train supervision is accomplished for the entire transit system, the train command system.

Central Line Supervision
That subsystem within the automatic train control system which monitors the system status and provides the appropriate controls to direct the operation of trains in order to maintain intended traffic patterns and minimize the effect of train delays on the operating schedule.

Centralized Traffic Control (CTC)
- A block signal system within which train movements are authorized by block signals whose indications are monitored and controlled at a central control.
- In rail systems, a traffic control system in which signals and switches are controlled from a remotely located (centralized traffic control) panel.

CEO
Chief Executive Officer

Chain of Custody
Chain of custody (CoC), in legal contexts, refers to the chronological documentation or paper trail, showing the seizure, custody, control, transfer, analysis, and disposition of physical or electronic evidence.

Characteristics, Operating
Those quantitative, measurable parameters pertinent to a specific system, subsystem, device or component that provide definition of performance.

Charger Output Current
The total amount of current measured at the output of a battery charger unit when connected to one or more batteries.

Charger Output Voltage
The voltage measured at the output of a battery charger unit.

Charging Equipment Meter
A device used for monitoring and measuring the voltage and current outputs of a battery charging unit.

Check

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In transit operations, a record of the passenger volume on all transit units that pass a specific location or time point (also known as a passenger riding court or check), the actual time the unit passes it (also known as a schedule check), the number of passengers who board and alight at each stop on a route or line (also known as an on-and-off count or check), or any combination of these items. The checker may ride the transit unit (an on-board check), follow it in another vehicle, or check the transit units from a particular location (a point or corner check).

Check Sheets
Forms with provision for acknowledging completing of outlined inspection and maintenance tasks.

Check Sum
A number derived from a cyclic redundancy check (CRC) used to verify accuracy of data.

Checked Redundancy
A characteristic of a system which ensures that the probability of any malfunction is controlled to produce a risk comparable to fail safe.

Checker
In transit operations, a person who observes and records passenger counts, timing, speeds, vehicle counts, schedule adherence, or other data useful in transit planning and scheduling. The position may be further specified as schedule checker, traffic checker, and so on.

Chest Compression Criterion
Peak *x*-axis deflection measured at the sternum filtered at CFC600.

Chest Deceleration Criterion
The resultant chest deceleration, filtered at CFC1000, shall not exceed 60g, except for intervals whose cumulative duration is not more than 3ms.

Chest Viscous Criterion (VC)
A value calculated according to the following formula, using the *x*-axis data measured at the sternum, filtered at CFC600:

Chest VC = 1.3 x V(t) x C(t)
Where
V(t) = instantaneous chest velocity (m/s)
C(t) = instantaneous chest compression ratio, C(t) = D(t)/229
D(t) = instantaneous chest compression in mm.

Chief Executive Officer (CEO)
The principal executive in charge of and responsible for the transit agency.

Chief Mechanical Officer (CMO)
Overall head of maintenance for either a particular mode of transportation or for multiple modes of transportation within the rail transit system.

Chief of Rail Transportation
Head of the rail transportation office who manages the safe, efficient movement of passengers through stations and on trains. Staff may include train operators, station managers, operations control personnel, transportation supervisors and support personnel. It should be noted that certain employees, such as station personnel, might report to departments other than transportation.

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Chief Operating Officer (COO)
Overall head of a particular mode of transportation, either bus and/or rail. Will oversee and direct the maintenance and operations activities of the mode. The COO may preside over more than one mode.

Chief Safety Officer[35]
- Head of the Office of Safety responsible for the safe operation of all modes of transportation, maintenance and construction for passengers, employees, contractors and the general public, property and the environment.
- Adequately trained individual who has responsibility for safety and reports directly to a transit agency's chief executive officer, general manager, president, or equivalent officer. A chief safety officer may not serve in other operational or maintenance capacities unless the Chief Safety Officer is employed by a transit agency that is a small public transportation provider that does not operate a rail fixed guideway public transportation system.

Chopper
A solid-state electronic device that controls electric current flow to traction motors by very rapidly turning the power on and off, resulting in gradual vehicle acceleration at reduced current use.

Circuit
Electric train line.

Circuit, Check-In/Check-Out
An electrical circuit that detects and transmits the front end of the train entrance into, and the rear of the train departure from a block for the purposes of determining block occupancy.

Circuit, Coded Track
A track circuit in which the energy is varied or interrupted periodically.

Circuit Controller
A device for opening and closing electric circuits operated by a rod connected to a switch, derail, or moveable point frog.

Circuit, Non-Vital
Any circuit the function of which does not directly affect the safety of train operations.

Circuit, Shunt Fouling
The track circuit in which the fouling section of a turnout, connected in multiple with the track circuit in the main track.

Circuit, Track
An electrical circuit of which the rails of the track form a part.

Circuit, Vital
Any circuit which affects the safety of train operations.

City Tie
The physical and/or software interconnection between RTA and public agency or municipal emergency systems.

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Civil speed limit
In rail operations, the maximum speed authorized for each section of track, as determined primarily by the alignment, profile, and structure.

Cleaning Platform
A platform elevated at car floor height for easy access to car interiors for personnel and equipment.

Clear Depth
As applied to step treads, is the distance measured vertically from the top surface of the tread to the closest obstruction anywhere within the specified minimum clear width and useable length.

Clear Length
As applied to handholds, is that distance about which a minimum 2-inch (51 mm) hand clearance (from obstructions due to car design) exists in all directions around the handhold. The clear length of one portion of a handhold does not include handhold portions in other directions or bend radii connecting non-continuous portions of a handhold. Intermediate supports may be considered part of the clear length. Unless otherwise stated limitations on handhold length apply to the clear length.

Clear Signal
A signal displaying a permissive aspect.

Clearance
The distance between specified points along the tracks and specified points on moving vehicles.

Clearance Points
Ass applied to handles, are the ends of the clear length.

Clearance Diagram[36]
- A diagram that establishes the minimum safe distance between all points on a moving vehicle and fixed wayside structures or appurtenances.
- A cross-sectional drawing showing the limiting dimensions to which railroad equipment may be constructed. It is normally qualified in two ways. First, it specifies that the overhang of the equipment on a curve of specified radius may not exceed the overhang on the same curve of a piece of equipment with a specified length between truck centers and built to the full diagram width. Second, it usually specifies some body deflection conditions under which the requirements of the diagram must still be met.

Clearance Envelope
- The space occupied by the maximum vehicle dynamic envelope, plus effects due to curvature and super elevation, construction and maintenance tolerances of the track structure, construction tolerances of adjacent wayside structures and running clearances.
- A cross-sectional drawing showing the limiting dimensions to which railroad equipment may be constructed. It is normally qualified in two ways. First, it specifies that the overhang of the equipment on a curve of specified radius may not exceed the overhang on the same curve of a piece of equipment with a specified length between truck centers and built to the full diagram width. Second, it usually specifies some body deflection conditions under which the requirements of the diagram must still be met.

Clear Width

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As applied to step treads, is the distance measured from the outboard surface of the tread to the closest inboard obstruction anywhere within the specified minimum clear depth and usable length.

Cleat
A device used to secure motor cables in place. A cleat typically consists of an assembly of two pieces of insulating material provided with grooves for holding one or more conductors at a definite spacing from the surface wired over and from each other, and with screw holes for fastening in position.

Closed Circuit Principle
The principle of circuit design using a normally energized electric circuit which, on being interrupted or de-energized is continuously compared with the controlling signal to generate an error signal.

Closed Circuit Television (CCTV)
- A non-broadcasting system for displaying video and text information.
- A security camera system.

Closed Loop
The principle of feedback control in which the response of a system is continuously compared with the controlling signal to generate an error signal.

Closed Loop Design
A system design that adheres to the closed-loop principle and requires verification of requisite conditions before the permissive state or action can be initiated and requires that the requisite conditions remain continuously present for the permissive state or action to be maintained. In a closed loop design, a permissive state or action cannot be initiated or maintained in the presence of detected failures. In addition, closed-loop design requires that failures to perform a logical operation, or absence of a logical input, output or decision do not cause an unsafe condition, i.e. system safety does not depend upon the occurrence of an action or logical design.

Closure Rails
The rails between the heel of a switch and the toe of a frog in a turnout.

Coach Seating
Revenue seats in rail passenger coach cars and cab cars, in all classes of service – business, first, coach, economy, etc.

Coast or Coasting
The mode of operation of a vehicle or train in which both tractive effort from the propulsion system and braking effort from the propulsion system and the friction brake systems are at zero.

NOTE: The inherent design characteristics of some propulsion systems will require that a negligible level of brake be present in the coast mode.

Code, Standard
The operating, block signal and interlocking rules of the Association of American Railroads (AAR).

Collision
A vehicle/vessel accident in which there is an impact of a transit vehicle/vessel with:
- Another transit vehicle
- A non-transit vehicle
- A fixed object

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- A person(s) (suicide/attempted suicide included)
- An animal
- A rail vehicle
- A vessel
- A dock

Collision Posts
Structural members of the end structures of a vehicle that extend vertically from the underframe to which they are securely attached and that provide protection to occupied compartments from an object penetrating the vehicle during a collision.

Collision Post Door
- The door opening between the collision posts of the car.
- The door opening between the collision posts of the car and normally used for passing between cars.

Collision Post Handhold
Handhold located at the end of the passageway of the vehicle to stabilize an employee when standing at the end of the car guiding reverse moves and to stabilize an employee when walking between cars.

Color Temperature
A numerical descriptor of the hue of a light source. It is expressed in terms of degrees on the Kelvin scale and refers to the temperature of a black-body radiator that produces light of the same hue as the source specified. Low color temperatures correspond to reddish (or warm) colored sources, such as candle flames or incandescent lamps, whereas higher color temperatures are associated with blueish (or cool) colored sources. Fluorescent and LED sources are available in a wide range covering low to high color temperatures.

Command Post
A location at the site of an emergency designated as the place from which the incident will be managed and through which all communication and activities will be coordinated.

Commercial Equipment
Any equipment available on the general market not constructed specifically for the PROA. This includes medical devices such as pacemakers.

Communication Circuit
A transmission path that conveys information from one location to another.

Communication System
System for exchanging information including two-way radio systems for communications between dispatchers and vehicle operators, cab signaling and train control equipment in rail systems, automatic vehicle locator systems, automated dispatching systems, vehicle guidance systems, telephones, facsimile machines and public address systems.

Communications Based Train Control (CBTC)
Is a continuous, automatic train control system utilizing high-resolution train location determination, independent of track circuits; continuous, high-capacity, bidirectional train-to-wayside data communications; and train borne and wayside processors capable of implementing Automatic Train Protection (ATP) functions, as well as optional Automatic Train Operation (ATO) and Automatic Train

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Supervision (ATS) functions.(Defined in the Institute of Electrical and Electronics Engineers (IEEE) 1474 standard).

Commutator
An assembly of bars of segmental section, insulated from each other and connected to the coils of an armature winding. The assembly comprises a hollow cylinder on which brushes bear, generally on the cylindrical surface but sometimes on the radial surface. The arrangement serves to connect each of the sections of the armature winding in turn with an external circuit connected to the brushes.

Commutator Brush
A piece of conductive material, usually carbon or graphite, that rides on the commutator of a motor and forms the electrical connections between the commutator and the power source.

Commuter
A person who travels regularly between home and a fixed location (e.g., work, school).

Commuter rail
A mode of transit service (also called metropolitan rail, regional rail, or suburban rail) characterized by an electric or diesel propelled railway for urban passenger train service consisting of local short distance travel operating between a central city and adjacent suburbs. Service must be operated on a regular basis by or under contract with a transit operator for the purpose of transporting passengers within urbanized areas, or between urbanized areas and outlying areas. Such rail service, using either locomotive hauled or self-propelled railroad passenger cars, is generally characterized by multi-trip tickets, specific station to station fares, railroad employment practices and usually only one or two stations in the central business district. Intercity rail service is excluded, except for that portion of such service that is operated by or under contract with a public transit agency for predominantly commuter services. Most service is provided on routes of current or former freight railroads.

Commuter Rail Locomotives
Vehicle type: Commuter rail (CR) vehicles used to pull or push commuter rail (CR) passenger coaches. Locative do not carry passengers themselves.

Commuter Rail Self-Propelled Passenger Cars
Vehicle type: Commuter rail (CR) passenger vehicles not requiring a separate locomotive for propulsion.

Compartmentalization
- A strategy for seat design in which the seat provides enough stiffness to absorb all or a substantial portion of the kinetic energy of a passenger thus preventing a tertiary impact.
- Compartmentalization is a seat design strategy that aims to contain occupants between rows of seats during a collision, preventing occupants from traveling over the tops of seat backs and impacting other more hostile objects. During sled testing, ATD compartmentalization is evaluated up until the point of maximum forward progress of the ATD. The ATD's torso must be confined between the seat backs (potentially deformed) of consecutive rows of seats until the ATD begins to rebound and move away from the impacted seat.

Competent Person[37]
One who can identify existing and predictable hazards in the workplace and who is authorized to take prompt corrective measures to eliminate them.

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Compliance Check
Observations of individual performance by a trained observer.

Component
- An article which is a self-contained element of a complete operating unit and which performs a function necessary to the operation of that unit.
- A part or subassembly having a unique function within the assembly in which it is incorporated. Wheels, bearings, gears, gear units, brake discs, transmissions, and couplings are components of wheel set assemblies. A component of a component is a subcomponent.
- An essential part of an equipment. It is often loosely used interchangeable with module or assembly.

Component Repair Shop
A facility specifically designed for repair, overhaul, and/or testing of electrical, mechanical, hydraulic, or pneumatic parts, modules assemblies, or sub-systems. It may be compared to a manufacturer's service repair shop. It may be a separate building or part of another shop.

Compound Fissure
A progressive fracture originating in a horizontal split head, which turns up or down in the head of the rail as a smooth, bright or dark surface, progressing until substantially at a right angle to the length of the rail. Compound fissures require examination of both faces of the fracture to locate the horizontal split head from which they originate.

Comprehensive Emergency Management (CEM)
A practice of emergency management that breaks emergency planning into four phases: mitigation, preparedness, response and recovery. CEM presents an "all hazards" approach to emergency management, focusing on procedures that can be used for multiple emergencies.

Compromise Joint (Bar)
Joint bars designed to connect rails of different heights and sections, or rails of the same section but of different joint drilling.

Conductive Personal Article
A personal item that can conduct electricity. Examples of conductive personal articles are metal watch bands, metal-framed safety glasses, finger rings, jewelry, metal belt buckles, hearing aids with external wiring, etc.

Conductor
- A material, usually in the form of a wire, cable, or bus bar, suitable for carrying an electric current.
- In rail transit operations, the operating employee who may control the doors on rail transit vehicles, or who may have fare-collecting duties, or both.
- In railroad operations, the operating employee in charge of the train and train crew.
- An attendant whose function is to operate doors and assist in train protection when required.

Conduit
A tubular raceway for holding wires or cables. It is either rigid or flexible, metallic or nonmetallic tubing.

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Configuration Control (Also called Configuration Management)
A process to assure that all documentation that describes a system and its various components is current and reflects the actual functional and physical characteristics of the system throughout its life cycle.

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Conflicting Route[38]
Two or more routes, opposing, converging, or intersecting, over which train movements cannot be made simultaneously without possibility of collision.

Connecting Rod
A rod that transmits linear mechanical motion within the switch machine, or that transmits such motion outside the machine to some part of the track switch assembly.

Consequence Management
Measures to alleviate the damage, loss, hardship or suffering caused by emergencies. These include measures to restore essential services, protect public health and safety, and provide emergency relief to affected state and local governments.

Consist
- In rail systems, the makeup or composition (number and specific identity) of individual units of a train.
- One or a group of cars acting as one unit and controlled by one operator from the driving cab.
- The specific grouping into a train of identified vehicles.

Construction (CON)
Begins with the development, fabrication, or construction of the engineered design for the selected alternative and concludes with the delivery of the completed project. This phase includes the inspection, review, and checkout of the delivered project and concludes with the determination that the delivered project meets the engineered specification.

Construction, Fire Resistant Non-Combustible
Non-combustible construction that has a fire resistance rating through application of protective fire-resistive membrane such as masonry or concrete to supporting steel.

Construction, Non-Combustible
Construction minimizing the hazards of fire using non-combustible materials for structural elements or assemblies, and by limiting the amount of combustible materials that are incorporated into the building construction.

Construction Inspector
Person designated by the RTA to be in charge of all or any part of the project site.

Construction Safety
The optimum degree of safety within the constraints of construction effectiveness, time and cost through specific application of safety management throughout all phases of the construction.

Consumable Inventory

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That class of inventory that, once used completely or for some pre-determined unit of time or distance, is replaced and discarded; i.e., lubricants, filters, brake shoes, etc.

Contact

A conducting part which co-acts with another conducting part to open or close an electrical circuit.

Angle

The angle of a tangent line at the point of contact between the wheel and rail with respect to the axis of the wheelset.

Back

A part of a relay against which, when the relay coil is de-energized, the current-carrying portion of the movable neutral member rests so as to form a continuous path for currents.

Front

A part of a relay against which, when the relay coil is energized, the current-carrying portion of the movable neutral member is held so as to form a continuous path for currents.

Normal

A part of a polarized relay against which, when the relay is energized with a voltage of normal polarity, the current-carrying portion of the movable pole member rests so as to form a continuous path for currents.

Rail

A rail mounted on insulators alongside the running rail which provides traction power for train propulsion.

Reverse

A part of a polarized relay against which, when the relay is energized with a voltage of reverse polarity, the current-carrying portion of the movable pole member rests so as to form a continuous path for currents.

Wire

An overhead electric conductor that supplies power to light rail, streetcars, trolley buses, and similar vehicles.

Contract Data Requirements List (CDRL) Submittal

Evidence submitted by a contractor showing that the material and equipment they furnish in accordance with the contract specifications meets the applicable standards named in the specifications. The CDRL itself is originally part of the contract specifications.

Contract Maintenance

The repair, overhaul a and testing of parts, modules, and assemblies under contract to other than an operator's own personnel. The work may be done on or off the operating property. The term also can apply to tasks such as facilities janitorial work, landscaping, etc. It is often used for specific items such as elevators, escalators, motors, bearings, etc., generally impacted by labor agreements.

Contract Operator

A contractor who operates and/or maintains the Rail Transit System.

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Contractor or Consultant

- Individuals, partnership, firm, corporation, joint venture, or other entity identified in the Contract, including their own personnel and the personnel of any subcontractors.
- Any individual or entity under contract with the rail transit system (including rail transit system and subcontractor personnel) to install, inspect, maintain and/or test vehicles, systems, and components. Also called a consultant.
- A person under contract with the RTA or an employee of a person under contract with the RTA to perform inspection and/or maintenance of rail transit vehicles.

Continuous train (Continuous Inductive Train Control)

A locomotive or self-propelled car apparatus that is constantly in contact with the track circuit and is immediately responsive to a change of conditions in the controlling section that affects train movement.

Continuous Welded Rail (CWR)

A number of rails welded together in lengths exceeding 400 ft.

Control

Brake

That system which generates control signals to the braking system that result in a desired application of brakes.

Continuous

The continuous generation of, and response to, control signals.

Deadman

The pressure or activity actuated device to detect inattention or disability of a train operator.

Discrete

The imposition of control signals at discrete points with respect to time or location.

Emergency

The automatic or manual generation of priority control signals within the system in direct response to non-normal conditions.

Center [Also referred to as Operations Control Center]

The facility where rail operations such as train control, train dispatching, train supervision and related field activities are directed for the entire rail transit system or for specific segments of a system if there is more than one. Sometimes referred to as Operations Control Center (OCC) or Rail Operations Control Center (ROCC).

Limit

Extremes of the range over which a control signal has effect.

Operator

The railroad employee in charge of a remotely controlled switch or derail, an interlocking, or a controlled point, or a segment of controlled track.

Pneumatic (CP) Valve

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A set of valves that routes compressed air to the switch machine to control switch movement and provides switch position indication.

Track[39]
Track upon which the railroad's operating rules require that all movements of trains must be authorized by a train dispatcher or a control operator.

Sidings
A designated siding, the entrance and exit of which are governed by signals.

Controller

- An employee, usually stationed in the control center, who is authorized and responsible for all train operations. Duties may include, but are not limited to, train control, train dispatching, train supervision, and related field activities.
- An employee, usually stationed in a control center, authorized and responsible to direct the operation of trains and activity on the mainline or in the yard.

Controller, Master

The device which generates local and train-lined control signals to the propulsion system or brake system.

Controller, Switch Circuit

A device for opening and closing electric circuits, operated by a rod connected to a switch, derail, or movable point frog.

Conventional Interlocking

An interlocking that uses a manual system of controls to align switches and clear signals to establish routes.

Conventional Rail Transport

Transportation systems that consist of steel-wheeled trains running on duo-rail tracks. Trains may be self-propelled or hauled by locomotive, with diesel or electric propulsion.

Conveyance

A means of carrying or transporting goods, people, or both.

Cordon Count

In planning, a count of vehicles and people across a designated (cordon) line to determine the total flow (people and vehicles by mode and time period) into and out of the study area.

Corona Effect

A type of localized discharge resulting from transient gaseous ionization in an insulation system, when the voltage exceeds a critical value. The ionization is usually localized over a portion of the distance between the electrodes of the system.

Corrective Action Plan

A plan prepared by the Branch (internal audit) or transit system (external audit) describing the actions it will take to implement corrective actions for any audit item found to be in Exception during an audit.

Correspondence

Agreement between controls and indications, or a function.

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Corrosion
The dissolving or eating away of the surface of metal through chemical action, either regularly and slowly as by rusting, or irregularly and rapidly as by pitting and grooving in the interior of boilers.

Corrosion Inhibitor
A substance used on metal surfaces to prevent the chemical action of corrosion.

Corrugated Rail
A wear condition on the railhead of alternate peaks and hollows, which may develop in service under certain conditions.

Cost Recovery Ratio
The ratio of total revenues to total costs; the inverse of operating ratio. It is often used for evaluation of alternative plans.

Cotter Pin
A short strip of soft, folded metal that is inserted through a bolt head or nut to prevent rotation and/or disengagement of that bolt or nut from its connection.

Count
- In transportation, a process that tallies a particular movement of people or vehicles past a given point during a stated time period. It may be a directional or a two-way value and is also known as a traffic count.
- In transportation, a volume of people or vehicles.

Coupling
Magnetic - coupling achieved by the use of energized electromagnets.

Coupling Transformer
An electrical device used for impedance matching.

Coupler
A device for connecting one rail vehicle to another. The mechanism is usually placed in a standard location at both ends of all rail cars and locomotives.

Automatic
1. A coupler that operates automatically. It may also be capable of uncoupling automatically.
2. An automatic connector that joins electric or pneumatic train lines together between rail cars.

Coupler Control Box/Panel
A device from which commands/signals are generated to initiate a coupling or uncoupling sequence of events and the isolation/connection of electric trainline circuits.

Coupler, Electrical
A mechanical device mounted to a mechanical coupler assembly that makes the electrical circuit connections between rail transit vehicles through a series of mating contacts.

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Coupler, Mechanical
A device that, as part of a coupler assembly, makes the physical connection between rail transit vehicles. Consists of a faceplate with alignment pins and matching holes to mate to a like device on another rail transit vehicle. Also known as the mechanical coupler head.

Coupler, Pneumatic
A self-sealing valve assembly mounted to a coupler assembly that allows for air pressure equalization between coupled rail vehicles.

Coupler Switch Box
A termination-point for electrical circuits to the electric coupler heads. Also known as a jumper/drum switch.

Coupler System/Assembly
A mechanical device optionally consisting of a mechanical coupler, electrical coupler, pneumatic coupler, draft gear, yoke, and impact energy absorber.

Cover board
A fiberglass cover over the contact rail to protect personnel from accidental contact with the rail.

Cover Board Bracket
A fiberglass bracket attached to the base of the contact rail to support the cover board.

Covered Employee[40]
Employees that operate a revenue service vehicle, including when not in service; operate a non-revenue service vehicle and/or maintenance equipment; or control dispatch or movement of a revenue service and/or maintenance vehicle. This definition also includes but not limited to all rail vehicle operators, dispatches, conductors and controllers.

CR
Mode: Commuter Rail

Cracking, Thermal
A heat-induced crack at the braking surface caused by frictional heating during breaking. Thermal cracking may occur in wheel trad and brake discs at the interface between the brake pad/disc and the brake shoe-wheel tread.

Crash Energy Management[41]
- A method of design and manufacture of vehicle structures that enhances crashworthiness by assigning certain sections of the car body the task of absorbing a portion of the energy of collision by crushing in a controlled manner in order to preserve occupant volume and minimize the consequences of occupant impacts with the vehicle interior. The controlled crushing and energy absorption functions are typically assigned to special car body structural members in the structural energy absorption zone that are designed to crush in a predictable and stable manner over a distance that depends on the design of the member and the desired amount of energy absorption. The use of supplementary energy-absorbing element(s) may be specified.
- An approach to the design of rail passenger equipment which controls the dissipation of energy during a collision to protect the occupied volumes from crushing and to limit the decelerations on passengers and crew members in those volumes.

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Crash Safety
A system characteristic that allows the system after potentially survivable accidents.

Crash Worthiness
- The capacity of a vehicle to act as a protective container and energy absorber during impact conditions.
- The ability of a car body to manage the energy of collision while maintaining structural integrity, so as to minimize casualties to occupants, other vehicles, and pedestrians.

Creepage
The shortest distance between two conducting parts measured along the surface or joints of the insulating material between them.

Creosote
As used in wood preserving, creosote is a distillate of coal tar produced by high-temperature carbonization of bituminous coal; it consists principally of liquid and solid aromatic hydrocarbons and contains appreciable quantities of tar acids and tar bases, it is heavier than water.

Crew Handhold
Handhold used to assist an employee while entering or leaving a passenger entrance.

Crib
The space between two adjacent ties.

Crippling Load
The ultimate strength of the occupant volume.

Criteria
A document or drawing containing actions or features that are recommended and should be implemented but maybe modified or waived with rationale. Criteria may be adopted as a standard or code.

Criteria Conformance Safety Verification (CCSV)
One of the steps of safety verification. This is a form signed off by the engineers, the BATC project managers, and the BART project managers verifying that the contract has met all the safety criteria for that contract or that all exceptions have been satisfactorily resolved.

Critical
A hazard severity category identified as “Category II, Critical”. Category II is defined as failure conditions which could result in significant system damage or severe injury on one or more persons.

Critical/Catastrophic Items List (CCIL)
A listing of Category I (Catastrophic) and Category II (Critical) hazards. This list is usually compiled from all hazards identified in analysis. It is used to track resolution of all identified hazards. Category I and Category II hazards identified from sources other than analysis are also contained in the project CCIL.

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Critical Defect
A defect that judgement and experience indicate could result in hazardous or unsafe conditions for individuals using or maintaining the product or could result in failure in accomplishment of the ultimate objective.

Critical Function List
A listing of those functions whose failure would cause system degradation below an acceptable level.

Critical Speed
The vehicle speed above which hunting typically occurs for a given truck.

Criticality
Assignment of relative importance to hardware or systems.

Cross (Equalizer) Bond
An electrical connection from one track to another track to distribute traction power return currents.

Cross-Level
The difference in height or elevation of one rail with respect to the other rail at any cross-section. On tangent track, the difference in height is measured with respect to a horizontal line. On super-elevated track, it is measured with respect to a line across the top of rails, with the height difference equal to super-elevation.

Cross Protection
A means to prevent the undesired (or unintended) operation of a signal switch, movable point frog, or derail as the result of a cross in electrical circuits.

Cross bond
An electrical connection between adjacent tracks used to balance negative propulsion return current between tracks.

Crossing
- Grade - a crossing or intersection of highways, railroad tracks, other guideways, or pedestrian walks, or combinations of these at the same level or grade.
- Railroad grade - the area where a road and a railroad cross at the same level, within which are included the railroad tracks, roadway, and roadside facilities for both road and rail traffic traversing that area.
- Track (railway crossing) - an assembly of rails and frogs that allows crossing of two tracks at grade.

Crossing at Grade
An intersection of two or more tracks at the same elevation; an intersection of one or more tracks with a roadway.

Crossover
Two turnouts, with track between the frogs, arranged to form a continuous passage between two parallel tracks.
- In rail systems, a track with two switches that connects two parallel tracks.

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- Pedestrian or vehicular links (at grade or grade separated) across a transportation facility.

Crossover (rail)
Two turnouts, with track between the frogs, arranged to form a continuous passage between two parallel tracks.

Crosstie (railroad tie, tie)
The transverse member of the track structure to which the rails are fastened. Its function is to provide proper gauge and to cushion, distribute, and transmit the stresses of traffic through the ballast to the roadbed.

Cropping
Cutting metal from the end of an ingot, bloom, or rail during the process of rail manufacture. Also, cutting of the ends of used rails to eliminate battered or damaged portions.

Cross Level
The vertical relationship of the top of one running rail to that of the opposite running rail at the same location on the track.

Crushed Head
A flattening or crushing down of the head of a rail.

Culvert
Any drainage or service structure under a roadway or guideway with a clear opening of 20 ft (6m) or less measured along the center of the roadway or guideway.

Current Collector
The mechanical component on an electric rail car that makes contact with the conductor that distributes the electric current.

Current, Foreign (Stray Current)
- Stray electric currents which are not a part of the system, that may affect a signaling system or contribute to galvanic corrosion.
- Stray electrical currents which may affect a signaling system, but which are not part of the system.

Current, Leakage
An electric current that flows through or across the surface of insulation when a voltage is impressed across the insulation.

Current of Traffic
The movement of trains on a main track in one direction specified by special instructions.

Current Overload Protection
- A feature in an electrical circuit that automatically disconnects propulsion return current between tracks.
- A feature in an electrical circuit that automatically disconnects the circuit whenever the current exceeds a specified level.

Curvature
The severity of a track curve expressed in degrees and minutes.

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Curve, Circular
A horizontal curve formed by a portion of a circular arc specified by its radius or degree of curve and length.

Curve, Spiral
A transition curve connecting a tangent to a circular curve.

Curve, Reverse
Two contiguous simple curves in opposite directions, with a common tangent at their junction point.

SIMPLE – A continuous change in direction of alignment by means of an arc of a single radius.
VERTICAL – An easement curve in the track to connect intersecting grade lines.

Customer Relations/Service
- The efforts of an RTA or its employees to constantly and consistently exceed the customer's expectations.
- The practices that a rail transit system employs to interact with customers.
- The practices and methods that an RTA employs to interact with external customers on a singular/personal and social/public basis. This includes passive and active interaction. These interactions primarily involve, but are not limited to: communicating with customers (e.g., conversations with RTA personnel, signage, brochures, public address announcements and media relations), the treatment of customers (e.g. scheduling for special events, upkeep of stations), and the consideration customers receive in the rail transit system's planning and operations (e.g., equipment and station design, revenue practices).

Cut-And-Cover
A method of construction that consists of excavating the terrain from ground level, placing a structure in the excavation, and then filling over the structure and returning it to its original surface.

Cut Line
- In planning, an imaginary line placed at a strategic location to intercept all the links in an identified corridor.
- In transit operations, the transverse division of a route as by a planned service change or an emergency.

Cut-Section
A location other than a signal location where two adjoining track circuits end within a block.

Cutout
A device designed to remove a feature or function from operation.

Cut Out Contact
A set of contacts that when opened disables an electrical device.

Cut Out Circuit
Any circuit that overrides the operation of automatic warning systems including switch cut out circuits and devices that enable personnel to manually override the normal operation of automatic warning systems.

Cyclic Redundancy Check (CRC)

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An algorithmic inspection of the data content of firmware.

D

Dap
A recess cut into a tie.

Dark Territory
Non-signaled territory. (Colloquial)

Data Analysis
- A systematic evaluation of an item based on a statistically valid sample and an analysis of collected information. The analysis should compare the data to a standard representing acceptable performance. Data analysis may be a running, tabulation of defects or removal rates for past periods, graphs, charts, or any other method depicting a norm.
- A systematic evaluation of an item based on statistically valid sample and an analysis of collected information. The analysis should compare the data to a standard representing acceptable performance. The data analysis may be:
    1. a running average
    2. a tabulation of defect
    3. removal rates for past periods
    4. graphs, charts, or any other method depicting a norm.

Data Base
- A collection of data from which information is derived and from which decisions can be made.
- A non-redundant collection of data items processable by one or more computer applications.

Data Collection System
The system used to gather, store, and catalogue performance results for the purpose of analysis and regulatory compliance.

Data Logging Equipment
A device used to capture, and store defined analog or digital data.

DC Converter
Converts high voltage direct current (dc) to low voltage dc.

DC-AC Inverter
A propulsion system that uses a variable voltage/variable frequency inverter to supply power to alternating current (AC) traction motors and thereby to accelerate the car and provide dynamic braking, if so equipped.

DC Chopper
A propulsion system that uses power semiconductors to regulate current dc traction motors and thereby accelerate the car and provide dynamic braking, if so equipped.

De-Energize
To deprive an electro-receptive device of its operating current.

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Dead Bus Protection
Dead bus protection is a control system feature that confirms that the HEP bus is not energized (dead bus) before allowing the local HEP output contractor to close. This prevents inadvertently connecting HEP sources to the same bus.

Dead Section
A section of track, either within a track circuit or between two track circuits, the rails of which are not part of a track circuit.

Deadhead
- To move a revenue vehicle in other than revenue service, for example, from one garage to another or from the end of a line to a garage. Such movement may include people using an employee pass and an occasional revenue passenger riding on an incidental basis. Also known as deadheading.
- A non-fare-paying passenger, most commonly a transit system employee traveling to work using a pass.

Deadman control or Deadman
- A pedal, handle, or other form of switch, or combination thereof, that the operator must keep in a depressed or twisted position while a rail vehicle (or train) is moving. If the control is released, the power is cut off and the brakes are applied.
- A pressure or activity actuated alertness device to detect inattention or disability of the train operator.

Deceleration
Decrease in velocity per unit time; in transit practice, often measured in feet per second squared (meters per second squared) or, in the United States, miles per hour per second.

Deceleration Device
Any mechanism including but not limited to, rope, grabs, rip stitch lanyards, specially woven lanyards, tearing or deforming lanyards, and automatic self-retracting lifelines/lanyards that serve to dissipate a substantial amount of energy during a fall arrest, or otherwise limit the energy on a person during fall arrest.

Deceleration Rate
- The net negative time rate of change of speed of a vehicle resulting from the summation of all forces acting upon it.
- Instantaneous rate of change of speed with respect to time during a brake application. The unite of measure is usually expressed as miles per hour per second (mphps). The deceleration rate may be speed-dependent.

Deck
In transit systems, the floor of a rail car.

Decoder
A device which transforms a received signal into a data format.

De-energize
- To deprive an electro-receptive device of its operating current.

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- Automatic door equipment that is disconnected from its power source and will not operate automatically.

Default Standard
Maximum interval for the performance of required periodic inspection and maintenance tasks.

Deficiency, Design
Any design characteristic which does not meet specified criteria.

Definite Train Location
A system for establishing on-track safety by providing roadway workers with information about the earliest possible time that approaching trains may pass specific locations.

Deformation Tube
A two-section tube as part of a coupler assembly, which upon unusual severe impact collapses one into the other for dissipation of energy and momentum. Acts as an energy absorption device. It is not repairable and must be replaced when activated.

Degradation
Falling from an initial level to a lower level in quality or performance.

Delivered Audio Quality (DAQ)
The quality of an audio message as heard by the human ear when delivered to a speaker or other audio device.

Delivered Visual Quality (DVQ)
The quality of a video message, text or image seen by the human eye when delivered and displayed on a monitor.

Demand Response (DR)
A transit mode comprised of passenger cars, vans or small buses operating in response to calls from passengers or their agents to the transit operator, who then dispatches a vehicle to pick up the passengers and transport them to their destinations. A demand response (DR) operation is characterized by the following:

a) The vehicles do not operate over a fixed route or on a fixed schedule except, perhaps, on a temporary basis to satisfy a special need, and
b) Typically, the vehicle may be dispatched to pick up several passengers at different pick-up points before taking them to their respective destinations and may ben be interrupted enroute to these destinations to pick up other passengers. The following types of operations fall under the above definitions provided they are not on a scheduled fixed route basis:

- Many origins – many destinations
- Many origins – one destination
- One origin – many destinations, and
- One origin – one destination

Departure Station
The first or initial station of a trip, where the train is either first placed in service or changes direction to start a new trip.

Departure Test

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- The process used to test rail transit vehicle systems controlled by train to wayside communication equipment.
- Operational test made on complete train in a yard or on a transfer track before permitting train to operate in a cab signal or automatic mode.
- Operational test made on complete train in a yard or on a transfer track before permitting train to operate on a main line.

Deployment, Vehicle
Strategy of locating vehicles, ready for service, at points which permit utilization for emergency situations.

Derail
- To run off the track.
- A device designed to cause rolling equipment to leave the rails.

Derailer
- A track safety device designed to guide a rail car off the rails at a selected spot to prevent collisions or other accidents, commonly used on spurs or sidings to prevent unattended rolling cars from fouling the main line; also known as a derailer.
- A device designed to cause rolling equipment to leave the rails.

Derailment
A non-collision incident in which one or more wheels of a rail transit vehicle unintentionally leaves the rails.

Design Phase
The phase of the life cycle which begins at the onset of preliminary design and ends when the design is finalized and ready to go into production.

Design Safety
- Safety achieved by the integration of safety features into the system design characteristics to prevent or minimize the probability of operation in an unsafe manner.
- Safety achieved by integration of safety features into the system design characteristics to prevent operation except in the manner intended to be safe.

Designated Authority
The titled position charged with responsibility of supervising, authorizing, directing, and/or controlling train movements and other facets of operations often from a central location. The local company title should be used in place of “designated authority”.

Designated Official [42]
Any person(s) designated by the employer to receive notification of non-complying conditions on on-track roadway maintenance machines and hi-rail vehicles.

Desired Rail Installation Temperature

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The rail temperature range, within a specific geographical area, at which forces in CWR should not cause a buckling incident in extreme heat, or a pull-apart during extreme cold weather.

Destination Sign
A sign on a transit unit (vehicle or train) indicating the route or line number, direction, destination of the unit, or any combination thereof. Destination signs are most commonly located on the front of the transit unit but may also be located on the back, side, or both.

Destination Station
The final or terminal station of a trip, where the train is either taken out of service or changes direction to start a new trip.

Detail Fracture
A progressive fracture originating at or near the surface of the rail head. These fractures should not be confused with transverse fissures, compound fissures or other defects, which have internal origins. Detail fractures usually have their origins in the following types of defects, and progress crosswise into head of the rail:

Shell
Where a thin shell of metal becomes separated from the head, usually at the gauge corner.

Head checks – usually at or close to the gauge corner where movement or flow of the surface metal is sufficient to start a hairline crack.

Detection Devices
Sensors used to detect and monitor the status of certain systems, e.g., open or closed doors, component temperatures, flow rates, etc. The status is usually displayed on control consoles.

Detector
A device used to measure or sense a physical property and produce and electrical output or contact closure.

Detector, Ground
A device for detecting a ground on an electrical circuit.

Detector, Point
A circuit controller which is part of a switch operating mechanism and operated by a rod connected to a switch, derail, or moveable point frog to indicate that the point is within a specified distance of the stock rail.

Detector, Track Circuit
A track circuit, within an interlocking which, when occupied by a train, prevents the position of a track switch from being changed.

Detour
A temporary change in a portion of a transit route or highway.

Device, Acknowledging
A manually operated device by means of which, on a train equipped with automatic train stop or train control, an automatic brake application can be forestalled, or on a train equipped with automatic cab signaling, the sounding of the cab indicator can be silenced.

Dew Point

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Temperature at which water vapor begins to condense.

Dew Point Depression
The difference between inlet ambient temperature and outlet dew point temperature. (T ambient – T outlet dew point)

Diagnostic Monitor
A monitor that displays the fault status of the systems on a car or a car within the train consist.

Diagnostic Review Team
A group of knowledgeable representatives, interdisciplinary in nature, that represents all groups having responsibility for safety at highway-rail grade crossings.

Diagnostic Test Equipment
Pre-programmed automatic-test sets used to check car circuitry and subsystems usually for use in shops but may refer to portable sets capable of being carried on cars or trains.

Diamond
A special track work assembly consisting of two end frogs and two center frogs, which comprise the central portion of a double crossover.

Diesel Light Rail Vehicle
A light rail vehicle which uses a diesel-electric generator as its primary power source.

Direct Current (DC) Ground Detector
A device used to monitor dc power supplies for grounded conditions and to display an alarm when ground conditions are detected.

Direct Current (DC) Polar Relay
A relay which operates in response to a change in direction of direct current in its controlling circuit and the armature of which may or may not remain at full stroke when its control circuit is interrupted.

Direct Fixation Fastener
A sub-category of elastic fastener in which the rail fastener attaches immediately to a rigid support (concrete, invert, concrete deck, floating slab, open-deck structure). Direction fixation systems are systems used on other than ballasted track. Resilient fasteners and embedded concrete blocks with elastomeric boots (embedded in invert concrete pockets) fall within the general definition of direct fixation fasteners.

Direction, Normal
The designated predominant direction of train movement as specified by the rules.

Direction, Reverse
Train movement in the direction opposite of the normal direction.

Directional Route Miles
The mileage in each direction over which public transportation vehicles travel while in revenue service. Directional route miles (DRM) are:

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- A measure of the route path over a facility or roadway, not the service carried on the facility; e.g., number of routes, vehicles, or vehicle revenue miles.
- Computed with regard to direction of service, but without regard to the number of traffic lanes or rail tracks existing in the right-of-way (ROW).

- Directional route miles (DRM) do not include staging or storage areas at the beginning or end of a route.

Directional Split
The proportional distribution opposite the normal direction.

Directly Operated (DO)
Transportation service provided directly by a transit agency, using their employees to supply the necessary labor to operate the revenue vehicles. This includes instances where an agency's employee provide purchased transportation (PT) services to the agency through a contractual agreement.

Disc Brake Pad
A replaceable friction element secured to a brake head for the purpose of producing a retarding force onto the face of a disc.

Disc Brake Unit
A friction brake in which the brake pads create retarding force by rubbing on a separate disc or discs mounted on the wheel hub or the axle.

Dishing
The amount of concavity of the surface of a brake disc due to wear.

Dispatch Point
- The location at which operating employees receive their assignments.
- The location at which trips are started or restarted.

Dispatcher
- In rail operations, an operating person within a control center whose function it is to dispatch transit units (cars or trains), monitor their operation, and intervene in the event of disruption of schedule or when any change in service or routing is required.
- In demand-responsive transportation, the person who assigns the vehicles to customers and notifies the appropriate drivers and who may schedule and route vehicles and monitor their operation.

Dispatcher, Automatic Train
A programmable device whose function it is to dispatch trains on predetermined schedule. An operating person, within a control center, whose function it is to dispatch trains, monitor train operation, and to intervene in the event of disruption of schedule or when any change in service or routing is required.

Dispatcher, Train
An operating person, within a control center, whose function it is to dispatch trains, monitor train operation and to intervene in the event of disruption of schedule or when any change in service or routing is required.

Dispatching and Supervising
Component activities include:

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- Providing supervision and clerical support for revenue vehicle movement control activities;
- Dispatching operators and vehicles from the operating station;
- Monitoring transit operations in communications and control centers;
- Supervising transit operations along transit routes; and
- Controlling the return of operators and vehicles to the operating station.
  These may be accomplished by conventional means or through the use of advanced technologies including automatic vehicle location, transit operations software and automated demand response (DR) dispatching systems. Vehicle guidance and intermodal transportation management centers may also be employed to assist revenue vehicle movement control activities.

Distance [Also referred to as Safe Braking Distance]
The maximum distance on any portion of any track which any train, operating on such portion of railroad at its maximum authorized speed, will travel during a full service application of the brakes, between the point where such application is initiated and the point where the train comes to a stop

Distant Signal
A fixed signal used to govern the approach to a home signal.

Distilled Water
Water that has been purified through an evaporation or condensation process.

Distortion
An undesired change in the waveform of a signal.

Disturbed Track
The disturbance of the roadbed or ballast section, as a result of track maintenance or any other event, which reduces the lateral or longitudinal resistance of the track, or both.

Documentation Developer
The organization responsible for delivery of passenger car technical documentation to the railroad.

Door

Control
Circuitry, including such safeguards and interlocks as required, which operates to open and close doors.

Control Station
A control panel, activated by a crew key, that provides a train crew the ability to control exterior power operated side doors wither locally and/or via training.

Guide
Tracks or other restraints that constrain the motion of door panels.

Isolation Lock
A cutout/lockout mechanism installed at each exterior side door panel (leaf) used to secure a door in the closed and latched position, to provide a door-closed indication to the summary circuit, and to remove power from the door motor or door motor controls.

Operator
The drive mechanism that operates door panels.

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Panel
The moveable barrier element of a vehicle entryway.

Pocket
A compartment into which a door panel is retracted when in the open position.

Status Indicator
A device visible to the train crew and/or passengers that provides an indication of the status (open or closed) of the door.

Summary Bypass
A device designed to override the door summary circuit.

Summary Circuit
A trainline door circuit that provides an indication in the controlling cab of the train that all exterior side doors are closed and latched, and/or locked out with door isolation lock.

Threshold Extension
A short-fixed floor extension at the vehicle doorways that helps close the gap between the vehicle and the platform, while still allowing reasonable speeds to be achieved if not stopping. Typically made of a resilient material to limit damages in case of accidental interference with a foreign object of or the platform.

Double Crossover
A combination of crossing with two right-hand and two left-hand switches and curves between them within the limits of the crossing and connecting the two interesting tracks on both sides of the crossing and without the use of separate turnout frogs.

Double-ended
- A rail vehicle with an operating cab at each end
- A vehicle with an operating cab at each end; also called bi-directional. Double-ended vehicles are normally also double sided.

Double-Ended Transit Unite (Bidirectional Transit Unit)
A rail car or train with an operating cab at each end.

Double-sided
Rail vehicle with doors on both sides

Down Time
The total time during which the equipment is not in acceptable operating condition. Down time starts with a failure event and ends at the completion of repair and functional checks/inspections.

Downgrading
Reassignment of an employee to a task or job that requires lower skills and usually has a lower rate of pay.

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Draft Gear
A device enclosed within a coupler assembly that transmits draft and buff loads to the car body.

Draft Gear Followers
Draft gear followers shall be reconditioned in accordance with AAR Specification M-212, current issue.

Drawbar
A metal bar/tube connected directly to the anchorage castings used to connect rail transit vehicles together without the option of an uncoupling device. This device normally has a draft gear.

Dress
To shape and trim the ballast to the required cross-section.

Driving Wheels
Wheels that are powered by a motor or engine and that provide the tractive effort, through contact with the running surface, that propels the vehicle.

Drop-Action Fender ("lifeguard")
A device mounted under the end of a trolley or light rail vehicle in front of the trucks, designed to trap foreign objects on the track and prevent them from becoming caught under the wheels. The most common form of drop-action fender (commonly referred to as a "lifeguard"), is arranged so that the fender tray drops to the rail head if an object strikes the leading trip bar.

Dropaway (Release Value)
The electrical value at which the moveable member of an electromagnetic device will move to its de-energized position.

Drop Table
A built-in shop device for removing and replacing complete trucks from vehicles, in place without raising the vehicle.

Dry Cell Battery
A voltage-generating cell having an electrolyte in the form of moist paste.

Dual Controlled Switch
- An interlocked switch that by means of a selector level may be hand or motor operated. Note: Normal position of selector lever is in motor position.
- Control that can be operated both manually and automatically.

Dual-Mode
Utilizing a combination of active (electrically powered) and passive (PL) light sources.

Dummy Trucks
Minimal car trucks consisting only of structural members, wheels and axles, and body support points but without motors, brakes, electric wiring, pneumatics, hydraulics, etc.; used to support and move car bodies under repair or storage in shop and yard areas. May also be used for emergency truck replacement under extreme mainline conditions.

Duplex

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Capable of transmitting and receiving simultaneously.

Duty Cycle
The operating conditions to which a transit vehicle is subject. Includes factors such as daily service duration, stops per mile, grades, climactic conditions, etc.

Duty – Tour[43]
The elapsed period from the time the employee initially reports for work to the time the employee is finally released from duty. The duty tour may include one or more interim periods of release.

Duty – Off-Duty Time[44]
Time during which an employee is free to leave the workplace, commute between work and home, engage in personal activities, and obtain rest. Off-duty time includes interim periods of release on of one-hour or greater, mandatory off-duty periods, days off, vacation days, and other periods not defined as "on on-duty time".

Duty – On-Duty Time
Time actually spent in the service of the transportation agency, whether or not compensated, including time performing safety-critical tasks and other tasks, time "standing by" to perform duties when instructed, and work breaks or interim periods of less than one hour. On-duty time can include drive or seat time as well as in station time, between runs, and other incidental tasks and duties. On-duty time does not include any interim period of release of one-hour or greater. On-duty time also includes time spent in transportation to and from a work location but does not include travel to/from home to work or work to home. On-duty time includes time devoted to train.

Dwell time
The time a transit vehicle spends at a station stop, measured as the interval between its stopping and starting times.

Dynamic Envelope
The maximum space that the vehicle will occupy as it moves over the track. Includes overhang on curves, lean due to the action of the vehicle suspension and track super elevation, track wear, wheel/track spacing, and abnormal conditions that may result from failure of suspension elements.

Dynamic Routing
In demand-responsive transportation systems, the process of constantly modifying vehicle routes to accommodate service requests received after the vehicle began operations, as distinguished from predetermined routes assigned to a vehicle.

E

Easement
A right acquired by one part to use or control property belonging to another party for a designated purpose, such as public utilities, streets or highways, transit lines.

Effectiveness
- In transportation, the correspondence of provided service to intended output or objectives, particularly the character and location of service; in other words, producing the intended result (doing the right things).

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- In transit, the degree to which the desired level of service is being provided to meet stated goals and objectives; for example, the percentage of a given service area that is within the desired 1/4 mi (0.4 km) of a transit stop.

Effective Daily Shop Capacity
A measure of the number of units a shop could handle over a three-shift day if every car spot were utilized on an average time/car/spot.

Effective Securing Device
When used in relation to a manually operated switch or derail means one which is:

1. Vandal Resistant
2. Tamper Resistant and;
3. Designated to be applied, secured, uniquely tagged and removed only by the class, craft, or group of employees for whom the protection is being provided.

Efficiency
The ratio of output (e.g., level of service provided) to input (e.g., cost or resource usage), that is, providing the desired result with a minimum of effort, expense, waste, and so on (doing things right).

Elastic Fastening System
Any rail fastening system that includes an elastic rail clip.

Elastic Rail Clip
A mechanical spring designed to hold a rail to is support (tie plate, elastomer plate, tie, etc.) providing continuous contact with the rail and the rail support during restraint or rail rotation and longitudinal rail movement. Equivalent terminology: rail clip, elastic clip.

Elastomer
Any member of a class of synthetic polymeric substances that, in the vulcanized state, can be stretched repeatedly to at least twice its original length and, upon release of the external load, will immediately return to approximately its original length.

Elastomer Pad
An assembly placed in the contact rail at approximately 1000 ft. intervals to accommodate thermal expansion and contraction of the rail.

Elderly and Handicapped (E&H)
People who may have special needs for services such as transportation. Transportation especially provided for their benefit is called elderly and handicapped (E&H) transportation. Transit operations may include discounted fares (E&H fares) for their benefit. The minimum age for elderly people varies by the program (e.g., 55+, 60+, 65+).

Electric Incline Railway
A railway in which vehicles are carried or conveyed by an electric hoist along inclined tracks. The hoist carries a single car, with or without counterweights, or two cars in balance. The system is used to overcome steep gradients.

Electric Lock Switch
A hand-operated switch equipped with an electrically controlled device which restricts the movement of the switch.

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Electric Locking

- The application of one or more electric locks or equivalent circuits, by which interlocked devices are secured against operation under certain condition.
- The combination of one or more electric locks and controlling circuits by means of which levers of an interlocking machine, or switches or other units operated in connection with signaling and interlocking, are secured against operation under certain conditions.

Electric Switch Machine

An electrically controlled device for positioning of switch point, the complete operation of the switch machine performs the three functions of unlocking, operating, and locking. Also referred to as power operated switch machine.

Electric Train Line Circuit

- A continuous electric circuit between all units of the train. The circuit is provided with control stations to permit the control of traction motors and other equipment from any operator's cab on the train (or, in special cases, from one cab only).
- Electrification (Railway Electrification)
  In rail systems, a term used to describe the installation of overhead wire or third-rail power distribution facilities to enable operation of electrically powered transit vehicles.

Electrolyte

- Typically, a solution of potassium hydroxide (KOH) and distilled water, or sulfuric acid (H_2SO_4).
- A substance that when dissolved in a suitable solvent becomes an ionic conductor.

Electroluminescence (EL)

Luminescence resulting from the application of an alternating electrical current to phosphor.

Electroluminescent

An internally illuminated device using luminous materials which employ low voltage electrical energy to produce low intensity light.

Electromagnetic Compatibility

The property of a system to operate as designed without degradation of operation and without causing degradation of operation of other equipment.

Electromechanical Code Rate Transmitter Relay

A device which uses electrical energy to produce and oscillating action to vary periodically an electrical circuit at a definite predetermined code of frequency.

Electromechanical Timer Relay

A motor driven relay with or without an electrically operated clutch, which will not close its front contacts or open its back contacts, or both, until the expiration of a definite time interval after the relay has been energized.

Electromotive Force

That voltage induced in a conductor when the conductor is moved across a magnetic field.

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Electronics Department
That functional unit within the maintenance organization that generally has responsibility for signals, fare collection, automatic train control sub-systems and shop repair.

Electronics Device
Electronic devices include but are not limited to:

- Mobile phone devices
- Music and/or photo download devices
- Electronic ear devices of any kind (except prescribed hearing aids
- Headphones, ear buds, or any devices that projects sound
- Portable computing devices
- Ancillary devices associated with an electronic device

Electro-Mechanical Code Rate Transmitter Relay
A device which uses electrical energy to produce an oscillating action to vary periodically an electrical circuit at a definite predetermined code frequency.

Electro-Mechanical Timer Relay
A motor driven relay with or without an electrically operated clutch, which will not close its front contacts or open its back contents, or both, until the expiration of a definite time interval after the relay has been energized.

Electro-Pneumatic Switch Machine
An electrically and pneumatically controlled device for functions of unlocking, operating, and locking.

An electrically and pneumatically controlled device for positioning of switch point, the complete operation of the switch machine performs the three functions of unlocking, operating, and locking.

Electro-Static Discharge

- The rapid transfer of electric charge (spark) between two bodies of different electrostatic potential (voltage) in proximity (air discharge) or in direct contact.
- The release of stored electrical energy.

Element, Wayside (Roadway)
That portion of the wayside apparatus of an automatic train stop, train control, or cab signal system, such as an electric circuit, inductor, magnet, ramp, or trip arm, to which the car borne apparatus of such system is directly responsive.

Elevated Guideway
A guideway positioned above the normal street activity level (e.g., elevated over a street).

Elevated on Structure
Rail transit way above surface level on structures. Transition segments above surface level on structures are included.

Elevation

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The difference in height between the outside and inside rails on a curve to compensate (at least partially) for the centrifugal force of a train going around the curve.

Elevator

A hoisting and lowering mechanism, equipped with a car or platform, which moves in guide rails or racks that serves two or more landings and is classified by the following.

Elevator, electric - a power elevator where the energy is applied, by means of an electric driving machine. “Geared traction” machines typically use a smaller high-speed motor with a gear reduction to a traction sheave. A “gearless machine” typically uses a larger low rpm motor without a gear reduction unit to the traction sheave.

Elevator, freight: An elevator used primarily for carrying freight and on which only the operator and the persons necessary for unloading and loading the freight are permitted to ride.

Elevator, Hydraulic: A power elevator where the energy is applied, by means of a liquid under pressure, in a hydraulic jack.

Elevator, Passenger: An elevator used primarily for carrying passengers.

Elevator, rack and pinion - a power elevator with or without a counterweight which is supported, raised, and lowered by a motor or motors which drive a pinion or pinions on a stationary rack mounted in the hoist way.

Elevator, roped-hydraulic: a hydraulic elevator where the energy is applied by a roped-hydraulic driving machine

Elevator Cab Control Panel

The station located inside an elevator car that is used to operate and control the elevator.

Elevator Home Panel

The station located outside an elevator at the home position that is used to operate and control elevators.

Elevator Home Position

A pre-determined location that an elevator is called to during emergency evacuation.

Embedded Wood Block System (in concrete inverts)

A type of track is used generally in subway or viaduct track construction in which each rail is supported by short tie blocks embedded directly in a monolithic concrete slab. Some systems also use a long crosstie every fourth or fifth block to connect both rails and ensure proper track gage during construction. Elastic or resilient fasteners are generally used with this type of track.

Emergency

- Unforeseen combination of circumstances and/or incidents with the potential to negatively impact safe transit operations that calls for immediate action, assistance, or relief.
- A situation which is life threatening or which causes damage on or in any transit facility, trainway, or vehicle.
- An unexpected event related to the operation of passenger train service involving significant threat to the health or safety of one or more persons, requiring immediate action. Examples include: derailment, highway/rail grade crossing accident, passenger or employee fatality or serious illness/injury, evacuation of train or security situation.

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Brake Application[45]

- A brake application resulting in the maximum retarding force available from the train brake system.
- An irretrievable brake application resulting in the maximum retarding force available from the train brake system.

Brake Device

A manually actuated device that can initiate an emergency brake application.

Call Box (ECB)

A component of the emergency telephone/passenger assistance device which contains the communications equipment used for calling the central monitoring facility.

Contingency Vehicle

Revenue vehicles placed in an inactive contingency fleet for energy or other local emergencies after the revenue vehicles have reached the end of their normal minimum useful life. The vehicles must be properly stored and maintained, and FTA must approve the Emergency Contingency Plan. Substantial changes in the plan (10%) change in fleet) require re-approval by FTA.

Entry Points

Doors or windows that may be opened manually from the vehicle exterior by means of a release mechanism that does not require special tools or keys.

Evacuation Unit (EEU)

A numerical value assigned to an egress element that correlates to the speed and ease of exiting by a rail passenger.

Exit Locator Signs

- Conspicuously marked emergency marking/signage used to identify and direct passengers to the nearest emergency exit location(s).
- Conspicuous emergency marking/signage used to identify and/or direct passengers to the nearest emergency exit location(s).

Exit Points

Doors or windows that may be opened manually from the vehicle interior by means of a release mechanism that does not require special tools or keys.

Management (EM)

All actions a rail transit system takes to reduce the impact of emergencies.

Management Plan (EMP)

The written document that contains a rail transit system’s emergency procedures and/or checklists.

Management Panel (EMP)

Typically located at tunnel stations at street level. The EMP will be equipped with terminals linked by fiber optic cables to all tunnel facility and communication systems and will allow the monitoring and operation of the tunnel in the event of closure. The equipment will include (but not be limited to) CCTV system monitoring and control, SCADA monitoring and control, transit radio, telephone

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lines, facility alarm monitoring equipment and any other equipment necessary to operate the tunnel for either a short or extended period of time.

Off-Wire Capability

On board energy storage intended only for making very short moves "off wire" (<656 feet (200m)) such as permitting a vehicle to clear an intersection in the event of a power failure, bypass a dead segment in a GLPS system or make a short move inside a maintenance facility.

Operations Control Center (EOCC)

A pre-identified location for senior officials from the RTA and, if required, emergency responders from participating outside agencies to meet and discuss strategies for coping with the emergency.

Pipe Pressure

An alternate term for air pressure that exists in a system of piping including trainline connections used for connecting locomotives and all cars for the passage of air to control the locomotives and car emergency air brakes.

Procedures Plan

A plan developed by the authority with the cooperation of all participating agencies for information, guidance, and use prior to and during and emergency. In the development of a fire and a panic situation emergency plan, the transit system authorities should:

1. Analyze possible conditions for the emergency mode of system operation relating to fire or panic situations
2. Identify the functions required of other portions of the system associated with the electrical, mechanical and communications system and from what locations these functions should be controlled
3. Ensure implementation of provisions for the required functions as developed and defined under the Emergency Procedures Plan.

Release Ring/Plate

A metal section encased within the coupler assembly into which shear/tension bolts are threaded.

Release/Tension Bolts

Threaded devices designed to break under a specified load when subjected to severe buff loads as a result of a collision or other causes. Also known as shear pin/bolts.

Responder

- Any individual employed by the RTA or a participating outside agency that plays an active role in emergency response or recovery.
- A member of a police or fire department, or other organization involved with public safety charged with providing or coordinating emergency services, who responds to a passenger train emergency.[46]

Response

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Procedures and/or checklists that are applicable to a wide array of emergency scenarios with minimal revisions for emergency-specific needs. Examples include procedures for evacuation, notification and crowd control.

Signage

- Textual and graphic messages designed to assist passengers and crew to exit a rail car in an emergency and to assist emergency responders in gaining access to rail cars from the exterior.
- Textual and graphic messages designed to assist passengers and train crewmembers in locating and using rail car emergency exits and to assist emergency responders in gaining access to rail cars using doors and windows from the exterior.

Specific Response Procedures

Procedures and/or checklists that have aspects that apply only to a specific given emergency scenario and cannot be easily applied to any other emergency scenario. Examples include procedures for earthquakes, hurricanes, terrorism and the release of dangerous substances.

Telephone

A system for communicating audio messages from specific points in the rail system to central locations. This system includes emergency call boxes and passenger assistance communication equipment.

Window Exit [47]

A window equipped with interior fittings to permit a passenger to easily remove the glazing complying with and having an EEU value of 1.0.

Eminent Domain

The power to take private property for public use without the owner's consent, on payment of “just” compensation.

Employee

An individual who is compensated by the transit agency as follows:

- For directly operated (DO) services, the labor expense for the individual is reported in object class (501) labor.
- For purchased transportation (PT) service, the labor expense for the individual meets the same criteria as object class (501) labor.
- Applies to Transit Employees and Contractors.

Employee, Operating

The employee of a transit system having direct and supervisory responsibility for the movement of trains.

Employee Work Hours

Employee labor hours, not including paid leave hours such as:

- Sick leave
- Holidays
- Vacations

Work hours include:

- Only labor hours for employees of the transit agency
- Both full time and part time

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- Permanent and temporary

Employer[48]
An RTA, or contractor to an RTA, which directly engages or compensates individuals to perform any duties defined in this standard.

Employees
Anyone the RTA employs either directly or by contract.

Emulation Mode
Non-ECP mode of operation in which the electronic pneumatic components emulate the performance of the 26C control valve and follow the brake pipe for determining brake cylinder pressure.

Enable
A design feature controlled automatically or manually by the train crew operation of the door.

Encoder
A device that transforms the format of the supplied data into the format required for transmission.

End Change
The process of changing the vehicle's operating direction. The operator moves from one operating position (cab) to the other, switching required control, communication, lighting and other directional functions in the process.

End Chipping
The loosening of metal at the top or gauge side at the end of a rail.

End Flow
Projection of metal into the end gap at the railhead.

End Handhold
Handhold located at the end of the vehicle to stabilize an employee when sing the uncoupling device or as needed when connecting and is connecting hoses and cables or when inspecting the vehicle.

End Hardening
Heat treatment of the top of rail ends, to minimize batter

End-of-Train (EOT) Device
The EOT is a device that is connected to the train line at the end of the train that contains a means of communicating with the HEU (Head End Unit), a brake pipe pressure transducer, and a battery that charges off the train line cable. The EOT is physically the last network node in the train and transmits a status message (EOT beacon) once per second. The status message includes the current brake pipe pressure that is displayed in the cab by the HEU.

End-of-Train Feature
A feature used to determine the end of the train or the last passenger car in the train for the door summary circuit.

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Endurance Limit[49]
Represents a stress level below which a load may be repeatedly applied an indefinitely large number of times without causing failure. Unless qualified, the endurance limit is usually understood to be that for completely reversed bending.

Energized
Automatic door equipment that is poised to operate when a command signal is received.

Energy Absorption Cylinder
A device used within a coupler assembly to absorb a high-impact coupling or severe buff loads. It is self-resetting.

Engine
A unit propelled by any form of energy, or a combination of such units operated from a single control, used in road or yard service.

Radio-controlled (slave unit) - in passenger trains, an unmanned propulsive unit within a train that is separated by rail cars from the lead unit but controlled from it by radio signals.

Steam - an engine driven or worked by steam; specifically, a reciprocating engine that has a piston driven by steam in a closed cylinder.

Turbine - a rotary engine actuated by the reaction or impulse or both of a current of fluid or gas subjected to pressure. A turbine is usually made with a series of curved vanes on a central rotating spindle.

Entrance/ Exit
The partially enclosed area of a car adjacent to the side loading doors. It provides access/egress to the car interior.

Entrance Gate
A highway rail crossing traffic control gate that is used on the approach lanes of traffic toward a highway rail grade crossing.

Environment
The physical conditions that exist within a given area that will be affected by a proposed project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance.

Environmental Consequences
Include environmental damage or the breach of any known environmental standard or regulation.

Environmental Impact Statement (EIS, 102 Statement)
A comprehensive study of likely environmental impacts that will result from major federally-assisted projects. An EIS is required by the National Environmental Policy Act of 1969.

Equalization (Wheel Load Equalization)
Describes the degree to which a vehicle maintains uniform vertical wheel loads over vertical track irregularities. As used in this standard, equalization refers to this measure under static conditions. For example, a measure of this equalization capability of a vehicle is the increase or decrease in vertical wheel loads when a single wheel is either above or below a uniform track plane established by the remaining wheels. The lower the change in vertical load associated with a track rise or dip, the better the equalization.

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Dynamic condition wheel equalization (as obtained by vehicle dynamic analysis) takes into account long warp track donation for vehicle or truck-to-truck equalization.

Equipment
Locomotives and cars.

Equipment Consist
A train, locomotive(s), cut of cars, or any single car not coupled to another car or locomotive.

Equipment Failure
The state in which equipment no longer meets the minimum acceptable specified performance and cannot be restored through operator adjustment of controls.

Equipment, Wayside
Train control or movement apparatus which is located along the track or wayside as opposed to the control center or other remote location.

Equivalent[50]
Alternative designs, materials, or methods that the railroad or railroad contractor can demonstrate will provide equal or greater safety for employees than the means specified.

Equivalency Review Committee (ERC)
An adjudicatory Committee comprise of representatives from APTA and appropriate industry subject-matter-experts to evacuate the equivalent attainment of PRESS promulgated standards through alternative methods.

Escalator
A moving stairway that moves up and down at an angle to transfer passengers from one level of a station or parking facility to another. Does not include non-passenger escalators used only for freight or by transit staff.

Escalator Clause
A provision in a contract that stipulates that wages or prices are to be automatically increased or decreased at specific times according to a schedule that is usually related to changes in the cost of living (cost-of-living allowance, COLA) as measured by a designated index or other standard (e.g., the consumer price index). The provision may also apply to any tie between employer benefits and the cost of living, as in a pension plan.

Escalator Support
The upper, lower, and intermediate supports needed to withstand the total loads of the escalator.

Estimated Unlinked Passenger Trips (EUPT)
The number of passengers who board public transportation vehicles. Passenger are counted each time they board vehicles no matter how many vehicles they use to travel from their origin to their destination.

Evacuation
A reportable evacuation is a condition that occurs when persons depart from transit vehicles or facilities for life safety reasons. Evacuations to a location that may put passengers or patrons in imminent danger (such as controlled rail right-of-way) must also be reported.

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Event [51]
Any accident/incident or occurrence

Event Recorder
A device used to capture, and store defined analog or digital data.

Exception
An item on an audit checklist which is found during an audit to need improvement in order to attain full compliance with the provisions of the System Safety Program Plan.

Exclusive Track Occupancy [52]
A method of establishing working limits on controlled track in which movement authority of trains and other equipment is withheld by the train dispatcher or control operator, or is restricted by flag persons.

Executive Software
Software that performs the basic operations of a system, e.g., memory mapping, addressing, self-diagnostics, etc. Typically, of standard format that does not change from instillation to instillation.

Existing Equipment
Passenger rolling stock that was accepted previous to the issuance of the recommended practice.

Exit Door
- A door intended to be used as part of an emergency exit path complying with *49 CFR 238.237* with a minimum width of 25 inches and having an EEU (Emergency Evacuation Unit) value of 2.0 per door leaf.
- A door intended to be used as part of an emergency exit path and complying with *49 CFR, Section 238.235, Doors* has an EEU (Emergency Evacuation Unit) value of 2.0 per door leaf. On multi-level cars, car end exit doors with a door threshold higher than five (5) feet (1.52 m) above top of rail shall not be considered to be an EEU.

Exit Gate
A highway rail crossing traffic control gate that provides full closure of the exit lanes of traffic from a highway rail grade crossing.

Exit Path
The path or corridor through a rail car which provides the preferred path of evacuation from the car.

Exterior Side Door(s)
The door(s) on the side of the passenger car normally used for passenger access and egress.

External Alarm
A visual message, light, or audible tone produced by an electrical system that is either seen or heard when the system has failed or has generated an error.

Externally Illuminated
- The light source is contained outside the device that is to be illuminated. The light source is typically fluorescent, incandescent or a dedicated fluorescent or incandescent source.
- The light source is contained outside the sign, device, legend, marking, or path that is illuminated, e.g., a non-photoluminescent sign with a light source shining on its surface. This source may be

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designed to provide dedicated illumination for a specific location or general emergency illumination. Fluorescent or incandescent lamps are typically used.

Extra Board
Means the roster or list of all operators who by virtue of length of service, or by choice, do not have a regularly assigned run. Part-time operators shall not be considered extra-board operators.

Extra Train
A train not authorized by a timetable schedule.

Eyelet
A closed loop electrical fastener that provides a terminating point for wiring. Also referred to as a ring terminal

F

Facility
A self-contained physical location housing a yard, a shop(s), operations center(s), or some combination thereof, with all necessary equipment and machinery.

Facing Movement
The movement of a train over the points of a switch which face in a direction opposite to that in which the train is moving.

Facing Point Lock
A mechanical lock, for a switch, derail, or movable point frog, comprised of a plunger stand and a plunger, which engages a lock rod attached to the switch point to lock the operated unit.

Facing Point Switch
A track switch, the points of which face traffic approaching in the direction for which the track is signaled**.**

Facing Seats
- Seats which are mounted in the car such that occupants face one another.
- Adjacent rows of passenger rail coach seats where one row of seats is facing forward, and one row of seats is facing backward. These seating configurations are referred to as face-to-face seats, or open-bay seats when a workstation table is not present.

Fail Safe
- A design philosophy applied to safety-critical systems such that the result of a hardware failure or the effect of a software error shall either prohibit the system from assuming or maintaining an unsafe state or shall cause the system to assume a state known to be safe.
- A design feature that shall maintain or result in a safe condition in the event of malfunction or system failure.
- A characteristic of a hardware system and its elements, the object of which is to ensure that any fault or malfunction will not result in an unsafe condition.

Fail Safe Circuit

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A circuit which must be energized to initiate a vital function, and which verifies the proper condition of each element before being energized.

Fail Safe Design
A design principle in which each of the elements which make up a system is analyzed to determine the potential consequence of failure of that element, alone or in combination with any or all other elements of the system, to ensure that a failure or a combination of failures will not result in an unsafe condition.

Fail Safely
The implementation of a function in a fail-safe manner.

Fail Soft
To fail in a manner that is consistent with fail-safe principles but that continues to provide some level of functionality. Under fail-soft conditions, vital functions are maintained, but at a lower or degraded level of functionality or operability. This includes a design using the concept of graceful degradation as part of the failsafe, in which the system is shut down through intermediate steps, all of which are fail safe.

Failed Component
A component which has ceased to perform its intended function.

Failure
An inability to perform an intended function.

Failure Analysis
The logical and systematic examination of a system to identify and analyze the probability, causes, and consequences of potential and real failure.

Failure Assessment
The process by which the cause, effect, responsibility, and cost of an incident (reported problem) in the transit system is determined and reported.

Failure, Critical
A failure which could result in major injury or fatality to people or which could result in major damage to any system or loss of a critical function.

Failure Critically Analysis
Study of the potential failures that might occur in any part of a system in relation to other parts of the system in order to determine the severity of effect of each failure in terms of a probable resultant safety hazard, and acceptable degradation of system performance.

Failure, Man
Failure due to human error.

Failure Management
Decisions, policies and planning which identify and eliminate potential failures.

Failure Mechanism
The process which results in a part or equipment failure.

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Failure Message
A visual or audible indication produced by a system to report failure.

Failure Mode
The description of the manner in which a failure occurs, and the operating condition of the equipment at the time of the failure.

Failure Modes and Effect Analysis (FMEA)
An inductive procedure in which potential malfunctions are identified and then analyzed as to their possible effects.

Failure Modes and Effects Criticality Analysis
An analytical technique which uses the cause and severity of potential failure modes of a system to determine design requirements.

Failure Rate
Rate at which failures occur as a function of time. If the failure rate is constant, it is frequently expressed as the reciprocal of mean-time between-failures (MTBF). Calculated for an article, it is the ratio of the total number of independent article failures to the total article operating hours.

False Occupancy
Indication of track occupancy when no train is present.

False Restrictive
The aspect of a signal that conveys an indication more restrictive than intended.

Familiarization Training/Training for Changes
- Training that is utilized to familiarize employees with existing and/or new conditions, equipment, rules, procedures, and other transit elements as a part of an introduction qualification phase.
- Training for changes is considered specialized training to instruct employees on new conditions in the system including, but not limited to, changes in vehicle equipment, track, signals right of way, other types of facilities such as stations, yards and shops, or operating, safety, customer service policies and procedures.

Fare Collection System
- The procedures and devices used to collect fares and to accumulate and account for fares paid.
- Automatic Fare Collection (AFC) - the controls and equipment that automatically admit passengers on insertion of the correct fare in an acceptable form.

Fare Recovery Ratio
The ratio of fare revenue to operating expenses.

Fare Registering Turnstile (Faregate)
A turnstile that unlocks to allow a passenger to enter the paid area after a pass or farecard or the correct amount of money or tokens is inserted in it. It records the fares paid.

Fare Revenue Collection Equipment

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Equipment used to collect fares such as fare boxes, turnstiles, and ticket machines.

Farecard Reader
A device that determines the value stored in a farecard when the farecard is inserted. A farecard reader may also be used for appropriately altering the value stored in a farecard. The device is usually used with a passenger turnstile or gate.

Fastenings
Clips, pads, insulators, joint bars, bolts and spikes.

Fastener Body
An elastomeric plate; a bonded fastener; the rail support component of a resilient fastener system. The term "fastener body" refers to a single component of bonded steel and elastomer. The fastener body provides the rail support in a resilient fastener system.

Fastener Locking Device
A device applied to a fastener to prevent the fastener from loosening.

Fastener Vertical Spring Rate
Also called vertical static stiffness, represents the slop of the load-vs.-deflection curve of the fastener over a prescribed range of loads (usually 1,000 lbf. to 12,000 lbf.). Modern resilient fasteners achieve good results regarding noise and vibration attenuation, as well as a track modulus similar to that of good ballasted track, by limiting the static vertical stiffness of the fasteners to no more than 100,000 lbf/in.

Fatality
- A death or suicide confirmed within 30 days of a reported incident. Does not include deaths in or on transit property that are a result of illness or other natural causes.
- The death of a person either at the time an accident/incident occurs or within 24 hours thereafter.

Fatigue
A physiological state characterized by a lack of alertness and reduced mental and physical performance that is often accompanied by sleepiness.

Fault
An undesired but functionally correct response in a system.

Fault Hazard Analysis (FHA)
An analysis applied to elements of the system to identify hazards associated with component failures and fault conditions.

Fault Tree Analysis
A deductive procedure in which hazards are identified and then analyzed as to their potential causes.

Federal Railroad Administration (FRA)
The Federal Railroad Administration is an agency within the United States Department of Transportation that creates and enforces rail safety regulations, administers railroad assistance programs and conducts research.

Federal Transportation Administration (FTA)

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The Federal Transit Administration is an agency within the United States Department of Transportation that provides financial and technical assistance to local public transportation systems.

Feed End
The point in an ac track circuit at which alternating current originates and is applied to the rails

Female Insert
An internally threaded component that is designed to anchor a threaded fastener such as an anchor bolt into a concrete support.

Fiber Optic Multiplexer (FOM)
A system used in the process of combining a number of individual channels into a common bit stream for transmission over fiber optic cable.

Field Side
The side of the rail farthest from the center of track. Opposite side is referred to Gage Side.

Final Acceptance
The point at which the owner accepts the elevator project as being complete including all submittal requirements. This may be a different point in time than substantial completion.

Final Design
Takes the formalized concept and engineering development and finalizes them in the plans, specifications, and bid documents required for awarding the individual construction and equipment fabrication and installation contracts.

Fire
Uncontrolled combustion made evident by flame that require suppression by equipment or personnel.

Fire Alarm Control Panel (FACP)
The unit that controls, monitors, and reports the status of the fire system detectors.

Fire Department Control Key
The key utilized to gain access to and control of elevator operating systems.

Fire Hazard
The potential for harm that results in a given fire scenario. This potential for harm is a function of many variables that effect ease of ignition, rate of fire growth as expresses through flame speed, rate of heat release, smoke generation and visual obscuration.

Fire Load
The average weight of the combustible contents of a room or floor area in pounds per square foot, including the building materials, furnishing, equipment, and transit vehicles.

Fire Resistance Rating
An hourly rating assigned to a tested element or assembly by the Underwriters Laboratories Inc., or other recognized authority.

Fire Risk

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The potential for a given fire scenario to occur which results in personal injury, often expressed in terms of hazard severity and scenario probability.

Fire Risk Matrix[53]

A decision tool that can be used by railroads to determine whether a fire safety risk is acceptable or unacceptable.

Fire Safety Design Features

Aspects of equipment design or other aspects of the railroad system design that are intended to reduce frequency of occurrence and severity of fire incidents, for example, the selection of flame-retardant materials.

Fire Scenario

The sequence of events resulting from a fire hazard in a specific environment on a specific type of equipment.

Fire/Smoke Emergency

Fire and/or the development of smoke or fumes that call for immediate action to correct or alleviate the condition or situation.

Firmware

A device that is programmed with instruction set software and installed in a processor-based system, e.g., electronic programmable read only memory (EPROM)

First Aid

Any one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters and so forth, which do not require medical care even though such care is provided by a physician or registered professional personnel.

Fixed Guideway (FG)

Fixed Guideway is a public transportation facility

- Using and occupying a separate right-of-way for the exclusive use of public transportation;
- Using rail;
- Using a fixed catenary system;
- For a passenger ferry system;
- For a bus rapid transit system.

Fixed Guideway Directional Route Miles (FG DRM)

The mileage in each direction over which public transportation vehicles travel while in revenue service on fixed guideway (FG). Fixed guideway directional route miles (FG DRM) include directional route miles (DRM) for:

- Rail modes (heavy rail (HR), light rail (LR), commuter rail (CR), inclined plane (IP), cable car (CC) and Monorail/Automated guideway (MG)
- Ferryboats (FB)
- Aerial tramways (TR)
- Bus (MB)
- Trolleybus (TB)

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- Commuter Bus (CB)
- Bus Rapid Transit (RB); and
- Other modes on exclusive right-of-way (ROW) and controlled access right-of-way (ROW). Fixed guideway directional route miles (FG DRM) do not include staging or storage areas at the beginning or end of a route.

Fixed Jumper
A fixed jumper is a variation of a HEP jumper cable in which only one end is provided with a plug, while the remaining end is provided with a flange for mounting on a vehicle. This approach is taken to permanently affix the jumper to the vehicle and reduce the number of contacts, since they are only present on one end rather than two.

Fixed Route Services
Services provided on a repetitive, fixed schedule basis along a specific route with vehicles stopping to pick up and deliver passengers to specific locations; each fixed route trip serves the same origins and destinations, such as rail and bus (MB); unlike demand responsive (DR) and vanpool (VP) services.

Fixed Seat
Seat which cannot be rotated, and not of the walkover type design. These seat types can only face in the direction at which they are mounted.

Fixed Signal
In rail operations, a signal at a fixed location that indicates a condition that affects the movement of a train.

Fixed Structure
A structure used by rail transit systems for the purpose of providing transit services.

Fixed Tables
Tables that are permanently affixed to the rail car. Tray tables attached to seatbacks are not considered to be fixed tables and are not subject to the requirements of this standard.

Fixed Termination System
An overhead contact system with a contact wire tension that is fixed at a specific temperature and varies for all other temperatures

Fixed Way
All wayside appurtenances.

Flagman/Flag person[54]
- When used in relation to roadway worker safety means an employee designated by the railroad to direct or restrict the movement of trains past a point on a track to provide on-track safety for roadway workers, while engaged solely in performing that function.
- Field Personnel assigned to control movement of trains by the display of hand signals, flags, or lights.
- Personnel assigned to control movement of train by the display of hand signals, flags, or lights. May also be assigned to protect workers who are engaged in activities on or near the right-of-way.

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- An employee designated by the RTA to direct or restrict the movement of trains past a point on a track to provide on-track safety for roadway workers.

Flange Angle
The flange angle (δ) is the maximum angle found on the surface of the wheel flange, measured with respect to the axis of the wheel set.

Flange Clearance
The maximum lateral distance a wheelset can shift from its centered position between the rails to a point at which the angle of contact between the wheel and rail does not exceed 25 degrees with respect to the wheelset axis.

Flange Way
The space way through a track structure which provides a passageway for a wheel.

Flasher
In rail systems, the flashing light at railroad grade crossings that warns motorists, bicyclists, and pedestrians of approaching trains.

Flat-End MU Car or Cab Car
A flat-end MU (Multiple Unit) cab or cab car is a vehicle with an end similar to that of a typical coach, such that the corner and collision posts are essentially vertical for their full height and in the same transverse plane, except as required for curving clearance.

Flat Rigid-Barrier Analysis
For conduct of car body crippling analysis, a simplified boundary condition may be assumed where the car body is squeezed between two platens up to the maximum load the car can sustain.

Flat Spot
Loss of roundness of the tread of a railroad wheel, caused by wheel sliding.

Flat Steps
The distance that the leading edge of the escalator step travels after emerging from the comb before moving vertically.

Flat Wheel
A rail car wheel that has a flat spot on the tread.

Fleet (rolling stock)
The vehicles in a transit system. Usually, "fleet" refers to highway vehicles and "rolling stock" to rail vehicles.

Fleeting
Manually established route selection, not canceled by the passage of a train.

Flip Seat
Seats that have bottom cushions that can be flipped up to provide additional space. Flip seats are often used in areas of a car to provide wheelchair parking space. They are also used in combination with a locking device to control access to seating which, when occupied, can present problems under certain conditions.

Float Slab

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A concrete slab supported by a resilient foundation and designed to support direct fixation tract and special track work in a manner that will dampen vibrations.

Flow Rate (Rate of Flow)

In transportation, the number of units (passengers or vehicles) passing a point on a transportation facility during some period of time, usually counted or re-computed in units per hour. For example, if 8 trains pass a point in the first half hour and 15 in the second, the volume for the hour is 23. However, the flow rate for the first half hour is 16 trains/hr., and for the second half hour the flow rate is 30 trains/hr.

Flowed Head

A rolling out of the metal on the head of the rail towards the sides without showing any indication of breaking down of the head structure.

Forestall

As applied to an automatic train stop or train control device: to prevent an automatic brake application by operation of an acknowledging device or by manual control of the speed of the train.

Foot-Candle (fc)

A unit of illuminance. One foot-candle is one lumen per square foot (lm/ sq. ft.). In the international system, the unit of illuminance is lux (1 fc = 10.76 lux).

Foot Guard

A filler for the space between converging rails to prevent the feet of persons from becoming accidentally wedged between the rails.

Foul

Restrict the intended movement of one or more rake system components because the component is snagged, entangled, or twisted.

Foul Time[55]

One method of establishing working limits on controlled track in which a roadway worker is notified by the train dispatcher or control operator that no trains will operate within a specific segment of controlled track until the roadway worker reports clear of the track.

Fouling of a Track[56]

- The placement of an individual or an item of equipment in such proximity to a track that the individual or equipment could be struck by a moving train or other on-track equipment, or in any case is within four feet of the field side of the near running rail.
- The placement of an individual or an item of equipment in such proximity to a track that the individual or equipment could be struck by a moving train or other on-track safety for roadway workers.

Fouling Circuit

The track circuit in the following section of a turnout, connected in multiple with the track circuit in the main track.

Fouling Point

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- The location on a turnout, back of the frog, at which insulated joints or derails are placed, at or beyond the clearance point.
- The location on a turnout, beyond the frog, at which insulated joints or derails are placed at or beyond the clearance point.

Fouling Section
The section of track between the switch points and the fouling point in a turnout.

Franchise
In transportation, the privilege or right granted a person, group, or organization by a government authority to provide general or specific transportation services, usually applicable to a geographically specified area.

Free Fall[57]
The act of falling before the personal fall arrest system begins to apply force to arrest the fall.

Free Fall Distance
The vertical displacement of the fall arrest attachment point on a person's body harness between onset of the fall and the point at which the system begins to apply force to arrest the fall. This distance excludes deceleration distance and lifeline and lanyard elongation but includes any deceleration device slide distance or self-retracting lifeline/lanyard extension before they operate and fall arrest forces occur.

Freewheeling
Running without influence of either the propulsion or braking systems, that is, with tractive and braking forces at zero.

Freight Compatibility
Service operating with both passenger and freight cars in direct release.

Frequency
The number of alternating current cycles per second.

Friction Clutch
A device that absorbs the shock encountered in switch operation. The clutch is adjusted to slip at a specific motor current.

Friction Factor (F Factor)
In a gravity model, the empirically determined value that expresses the effect of spatial separation between zones on trip interchanges.

Frog
A track component used at the intersection of two running rails to provide support and guidance for the wheels. It allows wheels on each rail to cross the other rail.

Frog, Movable Point
A frog equipped with points which are movable in the same manner as the points of a switch.

Frog, Track

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Track structure used, at the intersection of two running rails, to provide support for wheels and passageways for their flanges, thus permitting wheels on either rail to cross the other.

Front-Line Employee
An employee who directly interacts with customers or is directly involved with core business functions.

FTA State of Good Repair Program (Section 5337)
FTA grant program which provides capital assistance for maintenance, replacement, and rehabilitation projects of existing high-intensity fixed guideway and high-intensity motorbus systems to maintain a state of good repair. Additionally, SGR grants are eligible for developing and implementing Transit Asset Management plans.

FTE
Full-Time Equivalent.

Fuel
- In the conventional sense, a material or combination of materials that, when burned with air, produces heat and, often, explosive or mechanical energy.
- Alternative Fuel- a liquid or gaseous non-petroleum fuel.

Fuel Tank, internal
A fuel containment vessel that extends outside the car body structure of a locomotive.

Full Crew Law
A law or regulation that requires a minimum number of workers to be present on particular job assignments.

Full-height collision post, corner post
Any vertical framing member in the rail car body structure that spans the distance between the underframe and the roof at the car body section where the post is located. For collision posts located at the approximate third points laterally of an end frame, the term “full-height” applies to posts that extend and connect to supporting structural members in the roof at the location of the posts, or to a beam connected to the top of the end-frame and supported by the roof rails (or anti-telescoping plate), or to both.

Full Service Brake Application
A non-emergency brake application which obtains the maximum brake rate consistent with the design of the primary brake system(s).

Full-Time Employees
Employees of the transit agency meeting the local definition of full-time hours. Normally, these persons are entitled to receive the full benefits package (e.g., sick leave, vacation and insurance benefits).

Full-Time Equivalent
A unite that indicated the workload of a full-time employed person (or student) working 40 hours per week, or 2,080 hours per year. An FTE of 1.0 means that the person is equivalent to a full-time worker, while a FTE of 0.5 signals that the worker is only half-time.

Funicular Railway

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A passenger transportation mode consisting of a pair of rail vehicles (or short trains) permanently attached to two ends of the same cable, counterbalancing each other. It may have a single track with a turnout or a double track. This system is used to overcome steep gradients.

Fuse
A device used to protect an electric circuit from the effect of excessive current draw.

G

G
An acceleration equal to 32.2 ft/sec ² (9.8 m/sec²).

Gage
The distance between gage lines, measured at right angles thereto.

Gage Line
A line 5/8 inch below the top of the center line of head of running rail along that side which is nearer the center of the track.

Gage Side
The side of the rail nearest to the center of track. Opposite side is referred to Field Side.

Gage Face Angle
The angle of wear on gage face of rail at the normal angle to base to include rail cant where applicable.

Gain
- An increase in the effective power radiated by an antenna in a certain desired direction.
- An increase in received signal strength from a certain distance.

Gap
The shortest distance measured through air, between parts of different potentials.

Gasket
A sealing device used to protect equipment and used to prevent gases or liquids from passing through.

Gate
Entrance to block or route where signal information is conveyed.

Gate Down
A crossing gate is in the “down” or lowered position when it is horizontal in accordance with the predetermined design from vertical (typically 85 to 92 deg. Depending on specific gate mechanism adjustment and other factors).

Gate Up
A crossing gate is in the “up” or raised position when it is vertical in accordance with the predetermined design from horizontal (typically 85 to 92 deg. Depending on specific gate mechanism adjustment and other factors).

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Gauge

- Standard-a rail track gauge that is 4 ft 8.5 in (1.435 m) wide. Track-the distance between the inside faces of the two rails of a track measured 1 inch (1.59 cm) below the top of the rails and perpendicular to the gauge line.
- Broad (wide gauge) - a rail track gauge that is more than 4 ft 8.5 in (1.435 m) wide. The distinction is often made that wide gauge is slightly greater but broad gauge is substantially greater than 4 ft 8.5 in. Narrow-a rail track gauge that is less than 4 ft 8.5 in (1.435 m) wide. Narrow - a rail track gauge that is less than 4 ft. 8.5 in. (1.435 m) wide.
- Standard - a rail track gauge that is 4 ft. 8.5 in. (1.435 m) wide.
- Track - the distance between the inside faces of the two rails of a track measured _ inch (1.59 cm) below the top of the rails and perpendicular to the gauge line.
- The distance between the gauge lines, measured at right angles thereto (standard gauge is 56 ½ inches (135 mm).

Gauge Line

A line .626 inches (1.59 cm) below the top of the centerline of the head of the running rail along the side that is nearer the center of the track.

Gauge Plate

Metal plates that are typically insulated, extending from rail to rail, used to maintain gauge of track.

Gauge Rod

A metal rod, extending from rail to rail, used to maintain gauge of track.

General Emergency Response Procedures

Procedures and/or checklists that are applicable to a wide array of emergency scenarios with minimal revisions for emergency-specific needs. Examples include: procedures for evacuation, notification and crowd control.

General Notice

A notice issued to employees by the General Superintendent-Transportation containing operating instructions and/or information as may be necessary.

General Order

An order issued to employees by the General Superintendent of Transportation which changes, adds to or annuls Operating Rules, timetable information or special instructions.

General Railroad System of the United States

Encompasses all railroad systems, both freight and passenger, under the authority of the United States Federal Railroad Administration (FRA), as enacted by the Federal Railroad Safety Authorization Act of 1994, that must adhere to the rules and regulations set forth in the Code of Federal Regulations, Title 49 Transportation.

Gong

An electronic or electro-mechanical bell installed on a streetcar or light rail vehicle which can be rung at different rates depending on how rapidly the operating pedal or button is depressed. The bell sound produced is intentionally distinctive compared with audible warnings emitted by other road vehicles.

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Governor
- A device that holds the speed of an engine or motor approximately constant regardless of the load.
- A device that keeps an engine from exceeding a predetermined speed.

Gradeability
A vehicle's ability to climb and descend grades in a controlled manner.

Grade
Rise in elevation within a specified distance. As an example, a 1 percent grade is a 1 ft (m) rise in elevation in 100 ft (m) of distance (measured horizontally).

Grade Crossing
An intersection of a roadway and a rail right-of-way that cross each other at the same level (at grade). For street-running operations, each street intersection is considered a grade crossing (excludes driveways and parking lot entrances).

Grade Crossing Traffic Control Device
Any form of protective or warning device installed at a railroad or transit guideway grade crossing for the protection of highway or street traffic.

Grade Crossing Warning (See also Active Grade Crossing Warning)
The system used to inform road users of the approach or presence of a trains at highway-rail crossings which includes flashing light signals and necessary control equipment and may or may not include warning gates.

Grade Separation
A vertical separation of intersecting facilities (road, rail, etc.) by the provision of crossing structures.

Grinding
The removal of metal using a stone wheel, or a wheel or disc composed of other materials specifically designed for the removal of metal. Machine grinding is grinding that uses a machine tool, appropriately referred to as a grinder. Hand grinding is grinding using a handheld power tool.

Ground
- A conducting connection, whether intentional or accidental, by which an electrical circuit or equipment is connected to earth, or to some conductive body of relatively large extent that serves in place of the earth.
- A low resistance connection to earth potential.

Ground Bus
An interconnecting point in a signal equipment room at earth ground potential.

Ground Detector
A device for detecting a ground on an electrical circuit.

Grounding
The establishment of a low-impedance circuit or path to a designated ground plan or location.

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NOTE: Grounding may involve one or more bonds as well as an additional circuit element such as a cable or strap.

Ground-Level Power Supply (GLPS)
An external power supply for electric vehicle propulsion located on the guideway directly beneath the vehicle's path of travel. The guideway power source is divided into segments that are shorter than the vehicle's length, and for safety reasons these individual segments are energized only when a vehicle is over one of them. Can either be a contact or contactless type system; in the contact type, a pickup shoe rides along the surface of a power rail; in a contactless type, the electrical connection between vehicle and guideway is provided through induction or other air-gap transmission technologies.

Guard (Also referred to as Conductor)
An onboard train attendant whose function is to operate doors and otherwise assist in passenger movement and safety.

Guard Check Gauge
The distance between guard line and gauge line, measured across the track at right angles to the gauge lines.

Guard Face Gauge
The distance between guard lines, measured across the track at right angles to the gauge lines.

Guard Line
A line along that side of the flange way that is nearer the center of the track and at the same elevation as the gage line.

Guardrail
- In rail construction, a rail or other device that is laid parallel to the running rails of a track to prevent derailment or to hold the wheels in alignment and prevent their flanges from striking the points of turnouts, crossing frogs, or the points of switches.
- In highway construction, traffic barriers used to prevent errant vehicles from leaving their designated areas and striking fixed objects or entering hazardous areas.
- A rail or other structure laid parallel with the running rails of a track to control a derailed train, or at turnouts to hold wheels in correct alignment to prevent their flanges from striking the points of turnout or crossing frogs or the points of switches.

Guideway
- The portion of a transit line and its structures that exists within right-of-way fences, outside lines of curbs or shoulders, underground tunnels, cut or fill slopes, ditches, channels and waterways.
- That portion of the transit line included between the outside lines of curbs, or shoulders, underground tunnels, cut or fill slopes, ditches, channels, waterways, and including all appurtenant structures.
- Elevated - a grade-separated guideway on a structure that provides overhead clearance for vehicles that operate on the prevailing surface of the terrain.
- Open cut - a guideway below the prevailing surface of the terrain in a trench-like excavation (cut).

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H

H-Point

- Hip Point and measure according to SAE J 826.
- Hip Point location on the seated occupant as measured according to SAE J 826.

Hand Brake

- A braking device manually applied to an already stopped train to prevent rolling.
- A brake that can be applied and released by hand to prevent movement of a rail car.

Hand Crank

A tool designed for the manual operation of a switch machine. Also, the action of using such a tool.

Hand Rail

A rail serving as a support or guard on open platform cars to enclose the platform area and stabilize an employee standing on the open platform.

Hand Signal

A signal – the indication of which is conveyed by the motion or position of a person's hand or arm. A flag may be used to enhance visibility of a hand signal. A lantern or other suitable hand held light should be used to convey hand signals in tunnels or during hours of darkness.

Hand Throw Lever

A lever used to position switch points. The device can be used on a dual control switch that provides for either power or hand operation and on non-interlocked hand operated switches.

Handbook of Rules (Also referred to as Rule Book)

A set of codified regulations and procedures by which operating personnel are governed.

Handhold

A round bar or rail designed to be grasped with the hand. A handhold is secured by mechanical attachment to a wall or setting panel structure. Handholds may be oriented vertically, horizontally or at an angle.

Handicapped

People who have physical or mental impairments that substantially limit one or more major life activities. In the context of transportation, the term usually refers to people for whom the use of conventional transit facilities would be impossible or would create a hardship. These people are also known as transportation handicapped or as people who have a public transportation disability.

Hand-Operated Switch

- A switch which must be aligned by hand before a train or engine makes a trailing point movement through the switch.
- A non-interlocked switch that can only be operated manually.

Hand-Thrown Switch

A switch which can only be operated manually.

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Hard-Wired Radio
A radio communications device permanently mounted in a railroad vehicle and permanently connected to an antenna mounted on the vehicle.

Hazard[58]
- Any real or potential condition that can cause injury, death, or damage or loss of equipment or property.
- Any real or potential condition that can cause injury, illness, or death; damage to or loss of the facilities, equipment, rolling stock, or infrastructure of a public transportation system; or damage to the environment.

Hazard Analysis
An analysis performed to identify hazardous conditions for the purpose of their elimination or control.

Hazard Criticality
The minimum hazard risk or index value which can be accepted for a given potential hazardous situation.

Hazard Index
A quantitative measure, combining the numeric probability of occurrence with the hazard severity.

Hazard Level
A qualitative measure of hazards stated in relative terms.

1. Category I: Catastrophic - will cause death or system loss.
2. Category II: Critical - will cause severe injury, severe occupational illness, or major system damage.
3. Category III: Marginal - minor injury, minor occupational illness, or minor system damage.
4. Category IV: Negligible - Less than minor injury, occupational illness, or system damage.

Hazard Priority
The relative importance assigned to correct an unacceptable hazardous condition.

Hazard Probability (MIL-STD 882B)
The probability that a hazard will occur during the planned life expectancy of a system, expressed in potential occurrences per unit of time, events, population, items, or activity.

Hazard Risk
A qualitative measure of the relative likelihood of occurrence combined with the hazard level.

Hazard Severity
A subjective measure of the worst credible consequences resulting from the hazard.

Head End
The beginning or forward portion of any train.

Head End Power (HEP) [59]
- A system by which 480 VAC, 3-phase electrical power, to operate auxiliaries, is provided to railroad vehicles via a train line system. The power source can be locomotive (hence “Head End”), power car, or wayside power source.

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- A system by which 480 VAC, 3-phase electrical power, to operate auxiliaries, is provided to railroad vehicles from a central source via a trainline system. The source of power can be a locomotive, a power car, or a wayside supply. Head end power (HEP) is used under normal operating conditions to provide electrical power to the passenger equipment such as "normal" lighting.
- A system by which electrical power is provided to railroad vehicles from a central source via a trainline system. The source of power can be locomotive or a power car (Wayside supply from catenary, third rail, or trackside can also be transformed into HEP as it passes through the power system). HEP is used under normal operating conditions to provide electrical power to the passenger equipment systems, such as "normal" lighting. In the United States, 480 VAC, 3-phase systems are most common.
- Generated on board the locomotive of a passenger train used for purposes other than propelling the train, such as cooking, heating, illumination, ventilation and air conditioning.

Head End Train Line Terminator

A terminator shall be attached to the front of the train line that provides an electrical termination of the train line at the lead locomotive to minimize impedance-related communications faults. This termination circuit shall be a 50-ohm resistor in series with a 0.47-uF capacitor. The HEU shall automatically confirm the presence of the head end train line termination. If the termination includes an ITC network device, it shall be incapable of transmitting.

Head End Unit (HEU)

The HEU is a brake system control device mounted within the locomotive and used to control the ECP brae system. The following are the specific functions of the HEU:

1. Provide a man/machine interface to operate the ECP brake system
2. Provide a data display to the engineer
3. Provide controls that allow the engineer to make brake commands
4. Monitor the end-of-train (EOT) beacon
5. Provide a control signal to turn off train line power whenever communications with the EOT is interrupted or discontinued
6. Provide a control signal to command a momentary train line power application to restart CCDs that are shut down
7. Provide mechanisms to conduct ECP brake system diagnostic tests
8. Interface with locomotive system signals that interact with the train braking system
9. Interface with the locomotive ID module in order to obtain locomotive-specific data
10. Provide an interface to other locomotive system(s) with the intent of being able to provide appropriate locomotive retardation in conjunction with the ECP train braking.

Head Sign

A sign indicating the destination of the transit unit (vehicle or train), usually located above the windshield.

Headway

- The time interval between the passing of the front ends of successive transit units (vehicles or trains) moving along the same lane or track (or other guideway) in the same direction, usually expressed in minutes.
- The time separation between two trains, both traveling in the same direction on the same track, measured from the time of the head end of the leading train passes a given reference point to the time the head end of the train immediately following passes the same reference point.

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Headway Control
The means by which a desired headway is maintained.

Headway Management
A technique for managing the operation of transit units (vehicles or trains) that focuses on maintaining a certain spacing between units on the same line, instead of on adhering to a timetable. For example, if units become bunched, corrective measures might include delaying the units at the rear of the bunch to provide regular headways and hence load distribution, even at the expense of reducing timetable adherence.

Heartwood Face
The side of a timber tie about which the growth rings are concave.

Heavy-duty Elevator
An elevator designed specifically for the harsh environment and duty load cycles common to transportation system usage.

Heavy-duty Escalator
An escalator designed specifically for transportation system usage.

Heavy-duty moving walk
A moving walk designed especially for transportation system usage.

Heavy Maintenance and Overhaul (Backshop)
Maintenance facility where mechanics, machinists, and other maintenance personnel perform heavy overhaul and other related rebuilding activities to help revenue vehicles reach their targeted service life. Activities usually occur at mid-life (i.e., mid-point of useful life) to refurbish, overhaul, or replace major vehicle components.

Including:
- Engines, transmissions, or axles
- Fareboxes, radios, and other electronics
- Starters, alternators, and brake system
- Chassis parts and seats
- Bearings

Heavy Rail System
Heavy Rail is a mode of transit service (also called metro, subway, rapid transit, or rapid rail) operating on an electric railway with the capacity for a heavy volume of traffic. It is characterized by high-speed and rapid acceleration passenger rail cars operating singly or in multi-car trains on fixed rails; separate rights-of-way from which all other vehicular and foot traffic are excluded; sophisticated signaling, and high platform loading.

Heavy Rail Passenger Cars (HR)
Vehicle type: Rail cars with:
- Motive capability
- Driven by electric power taken from overhead lines or third rails
- Configured for passenger traffic

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- Usually operated on exclusive right-of-way (ROW).

Heel

- That end of a switch rail farther from the point and nearer the frog.
- The end of a frog farthest from the switch.

Heel Length

The distance between the half-inch point of frog and the heel, measured along the gauge line.

Heel Spread

- The distance, at the heel, between the gauge lines of a switch rail and its stock rail.
- Distance between gauge lines at the heel.

Helicoidal Spring Lock Washer

A washer design with one or more coils within the general class of springs that accommodate compression loading. Some lock washers incorporate a bolt or nut engagement protrusion intended to supplement bolt/nut back-out friction resistance.

HEP Jumper Cable

A cable assembly, having a 6 conductor (3 power and 3 control pins) plug on one or both ends, which is used to provide a flexible electrical connection between two cars and / or locomotives or a wayside equipment.

HEP Receptacle

The receptacle(s) mounted on the ends of rail vehicles and wayside equipment into which the HEP jumper cables mate.

HEP Source

A source of HEP, contained in a locomotive, power car or form a wayside power connection.

HEP Switchgear

The contactors, circuit breakers, power switches, overload protection and associated control components used to connect the HEP power source to the train line system.

HEP Trainline

An electrical cable system which allows HEP power to be transmitted over the entire length of a train. It includes both power and control conductors. The train line may connect to equipment in each vehicle, or may simply pass straight through, providing a power path between vehicles on opposite ends of that vehicle.

Heritage Trolley (or "Vintage Trolley" or "Historic Streetcar")

An electrically propelled rail vehicle for the conveyance of passengers, originally manufactured prior to Jan. 1, 1956, or a new vehicle designed to replicate the appearance and function of such vehicles. The term is also used to describe similar rail vehicles that are not electrically propelled but have the same appearance and function.

Hi-Rail (Also sometimes referred to as Hy-Rail)

Retractable steel rail wheels placed on highway vehicles, thus allowing movement on a track or on a highway.

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Hi-Rail Vehicle[60]
A roadway maintenance machine that is manufactured to meet Federal Motor Vehicle Safety Standards and is equipped with retractable flanged wheels so that the vehicle may travel over the highway or on railroad tracks.

Hi-Rail Vehicle, New[61]
A hi-rail vehicle that is ordered after December 26, 2003 or completed after September 27, 2004.

HIC 15 (Head Injury Criterion)
A value calculated according to the following: t1, t2 = Any two points in time during the head impact, in seconds.

Hidden Damage
Damage found after the repair work has started.

High Performance Photo Luminescent Material (HPPL)
- A material capable of emitting fluorescent and/or phosphorescent light at a high rate and for an extended period of time after absorption of light radiation from an external source by the process of photon excitation.
- A photoluminescent material that is capable of emitting light at a very high rate and for an extended period of time. For this standard, the minimum luminance value for HPPL is 7.5 millicandela per square meter (7.5 mcd/m^2), for 1.5 hours after removal of the charging light source. Unless otherwise permitted in this standard, the charging light source is specified as a fluorescent lamp with a color temperature of 4,000 to 4,500 K that provides an illuminance of no more than 1 fc on the test sample for a duration of no more than 1 hour.

Higher Speed Rail
For fast railway services with speeds less than 200 km/h (124mph) is considered higher speed rail.

High Speed Rail
High-speed rail is a type of rail transport that operates significantly faster than traditional rail traffic, using an integrated system of specialized rolling stock and dedicated tracks. While there is no single standard that applies worldwide, new lines in excess of 250 km/h (160 mph) and existing lines in excess of 200 km/h (120 mph) are widely considered to be high-speed, with some extending the definition to include lower speeds in areas for which these speeds still represent significant improvements

High-Restraint Fastener
Elastic fastener systems with maximum longitudinal rail restraint allowed by the particular fastener design. Generally, the term is invoked in projects that use both a low and/or zero restraint system and a normal, maximum restraint fastener. The term distinguishes between the normal fastener and the low-restraint fastener or zero-longitudinal restraint systems deployed on that project.

Highly Exposed (No External Protection)
Includes third rail shoe beams and current collection devices. Short circuit current not limited by onboard devices.

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Highway

- Arterial - a general term denoting a major highway used primarily by through traffic, usually on a continuous route.
- A public way for purposes of travel, including the entire area within the right-of-way. Also called street, road.

Highway-Rail Grade Crossing

- A location where a public highway, road, street, or private roadway, including associated sidewalks and pathways, crosses one or more railroad tracks at grade.
- The general area where a highway and a railroad's right-of-way cross at the same level, within which are included the railroad tracks, highway and traffic control devices for highway traffic traversing that area.

Hip to Knee Space

A horizontal dimension from the back rest of a seat to the back of the next seat. This dimension is measured along the centerline of an occupant placement in a horizontal plane tangent to the top of the bottom cushion.

HiPot

A test procedure in which insulation dielectric strength is tested at a high voltage potential selected in accordance with the nominal operating voltage of the circuit or device.
(WARNING: High potential testing involves potentially lethal voltages and must be done in strict accordance with all applicable safety precautions.)

Holding Lights

Indicators at wayside stations which, in conjunction with manual or automatic train dispatchers, are used to maintain scheduled train operation.

Home Signal

- A fixed signal at the entrance of a route or block to govern trains entering that route or block.
- A controlled signal located at the entrance to one or more interlocked routes or blocks to govern trains entering or using those routes or blocks.

Horizontal Split Head

A horizontal progressive defect originating inside of the rail head, below the running surface and progressing horizontally in all directions, and generally accompanied by a flat spot on the running surface. The defect appears as a crack lengthwise of the rail when it reaches the side of the railhead.

Hostler

An operating employee whose duties involve moving cars/rains, usually within a yard boundary; sometimes called yard attendant.

Hours of Service (HOS)

Rules or regulations intended to govern the number of hours an employee may work. Generally, HOS also incorporates mandatory rest periods.

Hours on Duty [See Duty - On-Duty Time]

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HPPL Material-Former
An HPPL material that is capable of emitting light at a high rate and for an extended period of time. The minimum luminance value for HPPL is 7.5 milli-candela per square meter (7.5 mcd/m²), for 1.5 hours after removal of the charging light source. Unless otherwise permitted in this standard, the charging light source is specified as a fluorescent lamp with a color temperature of 4000-4500°K that provides an illuminance of no more than 5 fc on the test sample for a duration of no more than 1 hour.

Hub Miles (Hub Kilometers)
Actual logged miles (kilometers) of vehicle operation, usually read from a hubometer or odometer.

Human-machine interface (HMI)
The software interface between the SCADA and the PLC. (see Supervisory Control and Data Acquisition and Programmable Logic Controller)

Hybrid Rail
A mode of transit operated on the routes of intercity railroads and has operating characteristics of commuter rail. This service typically operates diesel multiple-unit vehicles with characteristics of light rail vehicles. Hybrid rail vehicles are operated with temporal separation from railroad traffic.

Hy-Rail (See also Hi-Rail)
Attachments that make rubber-tired vehicles (trucks, autos, special work equipment) capable of operating on rails.

Hydraulic Pressure Control Unit
A device that controls and transmits hydraulic pressure to disc brake units in response to control commands.

Hybrid Vehicle
An off-wire capable vehicle which is also equipped with an on-board energy generation capability arranged to automatically charge the vehicle's energy storage devices. Energy generation can be provided by a fuel-electric generator, hydrogen fuel cell or other suitable method. The hybrid vehicle can operate indefinitely without the use of an external power supply, provided that the generator or other on-board energy source is kept operating. The hybrid vehicle is distinguished from a Diesel LRV by virtue of the fact that the generator is only used to charge the on-board energy storage device, as opposed to being the primary power source.

Hydrometer
An instrument that measures the specific gravity of a liquid such as the electrolyte of a storage battery.

Hysteresis
Mechanical energy loss that occurs under cyclical loading and unloading of suspension systems.

I

Icon
A sign or representation that stands for an object by virtue of a resemblance or analogy to it.

Illuminance
- The amount of light (luminous flux) falling on a specific area or surface. English units are foot-candles (fc) or lumens per sq. foot. International (SI) units are lumen per sq. meter or lux (lx).

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- The amount of light falling on a unit of area (e.g., 1 sq. ft. of surface). English units are foot-candles (fc) or lumens per square foot (lm/sq. ft.). International units (SI) are lumens per square meter (lm/m²) or lux (lx). One fc equals 10.76 lux.
- The amount of light falling on a unit of area. Measured in foot-candles.

Impact Seat
The forward-most seat in two rows of seats into which ATDs (Anthropomorphic Test Device [also referred to as Crash Test Dummy in 49 CFR Part 572] are thrown in the testing.

Impedance
1. In transportation, generally, any condition that restricts or discourages travel, or a measure of that condition.
2. In transportation modeling, any such condition explicitly accounted for within the model. Time and costs are the factors usually considered, but others may also be examined.

Impedance, Ballast
The impedance shunting a track circuit due to the condition of the ballast.

Impedance Bond
- An iron core coil of low resistance and relatively high reactance used to provide a continuous path for the return propulsion current around insulated joints and to confine the alternating current signaling energy to its own track circuit.
- A device of low resistance and low impedance to all frequencies to which it is not tuned, used with jointless audio frequency track circuits to couple inductively and confine the signaling energy to its own track circuit and equalize the return propulsion current between rails without impeding its flow.

Impedance Matrix
In planning, an array of zone-to-zone trip impedances, such as travel times and travel costs.

Impedance, Shunt
Impedance between rails presented by a train's wheels and axles and the wheel/rail interface.

In Advance of a Signal
The territory beyond a signal as seen from an approaching train.

In Approach of a Signal
The territory to which a signal indication is conveyed.

In Kind
- The intrinsic value of goods and services (work time, supplies, etc.) used to provide the required local participation for federal and state grants.
- State or local funds required by the federal government to complement federal funds for a project; also known as match or matching funds. A match may also be required by states in funding projects that are a joint state and local effort.

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Inaccessible Track[62]
A method of establishing working limits on non-controlled track by physically preventing entry and movement of trains and equipment.

Inboard
Towards the centerline of the car in either the transverse or longitudinal direction.

Incident
(As defined for Public Transportation systems subject to FTA safety regulation)

- An event that involves any of the following: a personal injury that is not a serious injury; one or more injuries requiring medical transport; or damage to facilities, equipment, rolling stock, or infrastructure that disrupts the operations of a transit agency[63].

Incident Commander (IC)

- The individual responsible for all functions at the field response level in accordance with the National Incident Management System (NIMS) and Incident Command Structure (ICS) protocols.
- The individual responsible for all functions at the field response level. If the transit agency is the only responder, then it will be the IC. When emergency responders such as the fire department and police are on site, they will take on the responsibility of IC.
- The RTA staff member responsible for managing and responding to emergencies/incidents and for acting as a liaison with emergency responders.

Incident Command System (ICS)
A system used to manage emergency response activities that consists of a hierarchy/chain of command (command function) and emergency communications protocols.

Inclined Plane Railway
A special type of tramway vehicle modified to run on rails so that its passenger seats remain horizontal while its undercarriage is angled parallel to the slope. It is used for steep gradients.

Independent Audit
An audit by an organizational group other than that performing the audited work. Can be part of the same company but must retain independent reporting to senior management other than that performing the work. May also be an outside organization.

Independent Power Source
A sealed battery, capacitive storage or other energy storage device located within the car body that is designed to power one or more emergency light fixtures or other devices when the normal head-end power, main car battery, auxiliary power, and/or wayside power are unavailable.

Indication
The information conveyed by the aspect of a signal.

Indication Contact
A conducting part which co-acts with another conducting part to open or close an electric circuit for the purpose of proving and removing voltage to an indication device.

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Indication Locking
Electric locking of control circuits which prevents actions that would result in an unsafe condition for a train movement if a signal, switch, or other operative unit fails to make a movement corresponding to a control command.

Indication Point
The point at which the train control or cab signal impulse is transmitted to the rail vehicle apparatus from the track element.

Indication, Signal
The information conveyed by the aspect of a signal.

Indicator, Approach
An indicator used to indicate the approach of a train.

Indicator, Audible
A sound-producing device used for attracting attention.

Indicator, Cab
A signal in the train operator's cab which conveys the automatic block aspects and indicates the prevailing speed command.

Indicator, Speed
An analog or digital speedometer mounted in cab.

Indicator, Switch (Position)
An indicator used to indicate the position of switch points.

Individual Train Detection (ITD)
- A procedure by which a lone worker acquires on-track safety by seeing approaching trains or on-track equipment and leaving the track before its arrival.
- A procedure by which a lone worker acquires on-track safety by seeing approaching trains or on-track equipment and moves to a place of safety before its arrival.

Induction Loop Sensor
A loop of wire (inductor) embedded in the roadbed that carries a small electric current used to sense a passing vehicle and to yield information about the presence and velocity of the vehicle. Induction loops are also used to actuate traffic signals.

Inductive Analysis
An analysis which determines the impact of specific events or failures on a system (A bottom-up approach. "What happens if a specific event or failure occurs?").

Inductor
A track element consisting of a mass of iron, with or without a winding, that stimulates the train control, train stop, or cab signal mechanisms on the rail vehicle.

Infrastructure

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- In transit systems, all the fixed components of the transit system, such as rights-of-way, tracks, signal equipment, stations, park-and-ride lots, maintenance facilities, etc.
- In transportation planning, all the relevant elements of the environment in which a transportation system operates.

Infinite Fatigue Life Threshold
Represents the cycle count threshold at which the endurance limit is achieved.

Informational line-up of trains
Information provided in a prescribed format to a roadway worker by the train dispatcher regarding movements of trains authorized or expected on a specific segment of track during a specific period of time.

Ingress/Egress Space
Space available for passengers to occupy or leave an occupant space. This has importance for both normal passenger seating and also for emergency exit considerations.

Inhibit
To prevent the operation of a feature or function.

Inner Guard Rail
A longitudinal member, usually a metal rail, secured on top of the ties inside of the running rail, to guide derailed car wheels.

Inspection
The checking or testing for condition, performance and safety of equipment against established standards.

Inspection Plate
The portion of the farebox on which coins and tickets land so that they may be seen by the operator.

Inspector (supervisor)
A transit employee who evaluates performance, enforces safety and work rules, and attempts to solve problems; an inspector may be mobile (covering several districts in a radio-equipped vehicle) or fixed (assigned to a post at a designated intersection).

Installer
The contractor or subcontractor responsible for furnishings and installing the escalator.

Insulated
A rail joint designated to arrest the flow of electric current from rail to rail by means of insulation so placed as to separate rail ends and other metal parts connecting them.

Insulated Joint
A joint in which electrical insulation is provided between adjoining rails.

Insulated Rail Joint
A rail joint in which electrical insulation is provided between adjoining rails.

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Insulating Block
An inert, dielectric part that prohibits the passage of electrical current between two electrically active metal components.

Insulator Base
The base of the insulator assembly attached to the invert or ties

Insulator Cap
The top of the insulator assembly where the contact rail sits

Integral Motor
A motor with an HP rating that is one (1) or greater.

Integral Structure (integral vehicle construction)
A vehicle in which the frame and body are built as one unit, so that all principal members are load bearing, as distinguished from body-on-chassis.

Integrated Test
- Those tests performed to demonstrate that a system or systems function satisfactorily when connected to interfacing systems.
- Begins with activities to identify, plan and conduct tests to evaluate integration of the delivered and accepted project into planned revenue operations. This phase concludes with verified documentation of compatibility between system elements.

Integration/Test/Checkout Phase
The phase of the life cycle which begins when the equipment is installed, extending through system checkout, and ends when the system begins revenue operation.

Interchange
- The system of interconnecting ramps between two or more intersecting travel ways (highways, transit guideways, etc.) that are grade separated.
- The transfer of rail cars from one railroad or transit agency to another so that they may be used by someone other than the owner.

Intercom
A communications system within a train consist which is keyed into by a train crewmember for transmission/broadcast to/from specific locations within the train and used to provide train crew-to-passenger communication and intra-crew communication.

Interconnection
The electrical connection between the railroad active warning system and the traffic signal controller assembly for the purpose of preemption.

Interface
- The junction points or the points within or between systems or subsystems where matching or accommodation must be properly achieved in order to make their operation compatible with the successful operation of all other functional entities.

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- A point at which two or more systems, subsystems, or structures meet to transfer energy and/or information.

Interface Hazard Analysis
An analysis performed on a system to identify, classify, and eliminate hazards. It identifies safety problem areas of an entire system and assesses total system risk by examining the interfaces of the subsystems.

Interference Fit
The difference in diameters between two assembled components where the bore of the fitted component is smaller than the seat onto which it is fitted.

Interim Maintenance
Maintenance from the point of substantial completion, but prior to revenue service.

Interior Fitting
Any auxiliary component in the passenger compartment of locomotive cab which is mounted on the floor, ceiling, wall, or end walls, and projects into the passenger compartment or cab from the surface to which it is mounted.

Interline
In public passenger transportation, a term denoting the interchange of passengers between one or more bus lines, rail transit lines, or railroads.

Interlocked Switch
A track switch within interlocking limits, the control of which is interlocked with other functions of the interlocking.

Interlocking
- An arrangement of switches, locks and signal devices that is located where tracks cross, join or separate. The devices are interconnected in such a way that their movements must succeed each other in a predefined order, thereby preventing opposing or conflicting train movements.
- An arrangement of signals and signal appliances so interconnected that functions must succeed each other in proper sequence, permitting train movements over controlled routes only if safe conditions exist.
- An arrangement of signals and signal appliances so interconnected that their movements must succeed each other in proper sequence and for which interlocking rules are in effect. It may be operated manually or automatically

Interlocking, Automatic[64]
- An interlocking controlled by circuit logic so that movements succeed each other in proper sequence without need for manual control.
- An arrangement of signals, with or without other signals appliances, which functions through the exercise of inherent powers as distinguished from those whose functions are controlled manually, and which are so interconnected by means of electric circuits that their movements must succeed each other in proper sequence, train movements over all routes being governed by signal indication.

Interlocking, Manual

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- An interlocking operated manually from an interlocking machine, so interconnected by means of mechanical or electric locking that movements must succeed each other in proper sequence.
- An arrangement of signals and signal appliances operated from an interlocking machine and so interconnected by means of mechanical and/or electric locking that their movements must succeed each other in proper sequence, train movements overall routes being governed by signal indication.

Interlocking, Relay Type
An interlocking in which locking is accomplished electrically by interconnection of relay circuits.

Interlocking Control Panel
A panel displaying a line diagram of the trackage in and near a particular interlocking or group of interlockings, and equipped with various pushbuttons, electric switches, indicator lights, and audible alarms to allow control and monitoring of that section of trackage.

Interlocking limits
The track length between the most remote opposing home signals of an interlocking.

Interlocking Machine
An assemblage of manually operated devices for the control of signals, switches, and other units, and including mechanical or circuit locking or both to establish proper sequence of movements.

Interlocking Relay
A relay having two independent magnetic circuits with their respective armature so arranged that the dropping away of either armature prevents the other armature from dropping away to its full stroke.

Interlocking Signal
A signal which governs movements into or within the interlocking limits.

Interlocking Station
A place from which an interlocking is operated.

Intermodal
Between or including more than one means or mode of transportation. Service coordination between two or more different transportation modes. This arrangement may include joint (transfer) stations, coordinated scheduling, joint fares and combined public information activities.

Internal Logged Error
An abnormal condition or communications error generated within a device, circuit, or system that is displayed and stored for memory.

Internally Illuminated
The light source is contained inside the device that is illuminated. The light source is typically incandescent, fluorescent, electroluminescent, light emitting diodes (LED) or self-luminous.
The light source is contained inside the sign, device, or legend that is illuminated, e.g., a light fixture with the word “EXIT” printed on the diffuser. The light source is typically incandescent, fluorescent, EL, or LED.

Intersection

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The point at which two or more roadways meet or cross.

Interurban
A higher-speed street car (tram) line – i.e. electrical railcars or trains which run both between the cities or towns (often in rural environments) on their own right-of-way, and throughout the city streets as trams.

Inverter
Device used to convert dc voltage to alternating current (ac) voltage.

Investigation[65]
The process of determining the casual and contributing factors of an accident, incident, or hazard, for the purpose of preventing recurrence and mitigating risk.

Investigator in Charge
The Rail Transit Agency staff member (generally from the safety department, or alternately the risk department) responsible for the detailed investigation of an emergency/incident.

Ionization
The formation of or separation into ions by heat, electrical discharge, radiation, or chemical reaction.

Island
The portion of the highway rail grade crossing where the highway and/or pedestrian walkways directly cross the railroad tracks.

J

Jerk
Time rate of change of acceleration or deceleration of a vehicle measured in feet per second cubed (meters per second cubed).

Joint-Use Corridor
A transportation right-of-way used for more than one mode of transportation, such as trains and automobiles.

Joint Development
- In transportation, ventures undertaken by the public and private sectors for development of land above, below, or along transportation facilities.
- Coordinated development of an area by the public sector and private enterprise.

Joint Operations
- Rail operations conducted on a track used jointly or in common by two or more rail companies.
- Operation of a train, locomotive, car, or other on-track equipment by one railroad over the track of another railroad.

Joint, Rail; Insulted

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A rail joint in which electrical insulation is provided between adjoining rails.

Jumper Cable (Jumper)
A flexible conductor or group of conductors arranged to connect electric circuits between adjacent vehicles or rails.

Jumper Cable, 27 Point
A cable assembly, having a 27-conductor plug on one or both ends, which is used to provide a flexible electrical connection between two cars and/or locomotives.

Jumper, Fixed
A cable assembly, having a 27-conductor plug on one end and the other end permanently fixed to the vehicle, which is used to provide a flexible electrical connection between two cars and/or locomotives.

Junction
1. In transit operations, a location at which transit routes or lines converge or diverge.
2. In traffic engineering, an intersection.

Junction Box
An enclosure that contains electrical connections and/or hardware.

Junction Point
- A location at which a rail branch line track connects with a main-line track.
- A location at which two or more railroads interchange cars over connecting tracks.
- A location at which several transit lines converge.

K

K Factor
- In a gravity or similar model, a travel constant that reflects intangible values and perceptions of the user, for example, modal image, friendly service.
- In vehicle operations, the ratio of the minimum operating separation between two vehicles to the maximum emergency stopping distance. Normally, the factor is greater than 1 to provide a margin of safety.

Kemil
Thousands of Circular Mills (kemil supersedes the abbreviation MCM).

Key-By
The act of lowering a trip stop in order to pass a signal displaying a stop indication. (So called because of the use of the operator's key to actuate the mechanism for lowering the trip stop).

Kiosk
An octagonal structure located at each entrance to a station which serves as the hub of communications for the station.

Kiss and Ride (kiss ‘n’ ride, K&R)

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An access mode to transit whereby passengers (usually commuters) are driven to a transit stop and left to board a transit unit and then met after their return trip. Transit stations usually provide a designated area for dropping off and picking up such passengers.

Knuckle Pivot Pins
Knuckle Pivot Pins may be reused if they meet the requirements outlined in AAR Specification M-212, current issue.

L

Labeling
Every elevator controller shall be clearly marked permanently on the controller with rated load and speed, manufacturer serial number, and the designated Owner identification.

Ladder
- A track connecting successively the body tracks of a yard.
- An arrangement of treads and/or handholds used for climbing to allow an employee to access equipment or perform a function that cannot be done from the ground.

Lanyard[66]
A flexible line of rope, wire rope, or strap that is used to secure a body harness to a deceleration device, lifeline, or anchorage.

Lap
The position of a brake valve in which the pressure being controlled is being neither increased nor decreased.

Latch
A mechanical device used to secure a door in the closed position in normal operation.

Latch Block
The assembly that latches the crank cut out contacts in the open position when engaged by a hand crank.

Lateral
- The horizontal direction perpendicular to the direction of travel of a rail vehicle.
- The direction in a horizontal plane parallel to the direction of travel.

Lateral Crash Pulse
A time-based acceleration curve, triangular and symmetrical in shape and having 250 millisecond base and a 4g peak. A lateral crash pulse is in the direction perpendicular to the normal direction of travel of the car, either horizontal or vertical.

Lateral Motion
In rail operation, motion crosswise of the path of travel that results from the flexibility that must be provided in the track structure to permit its negotiation. It is experienced by all rail car parts except the wheels and axles. Lateral motion may also occur when the wheel tread is worn to a dished profile. This type of wear causes truck hunting at speed and hence produces lateral motion.

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Late Trip
A trip in which the train arrives at its destination station more than 5 minutes later than its scheduled arrival time a that station. A late trip is measured from end to end of the run. A train may be late at intermediate stations., but the time can be made up prior to reaching the destination station. A trip in which the train skips stations to make up time must be counted as a late trip.

Launch Seat
The rear-most seat of two rows of seats, initially containing ATDs (Anthropomorphic Test Device [also referred to as Crash Test Dummy in 49 CFR Part 572] in the testing described in Sections 5.2.1 and 5.3.4 of APTA PR-CS-S-016 99 Rev 2

Lay-By
In rail systems, a side track.

Layover Zone
A designated stopover location for a transit vehicle at or near the end of the route or line or at a turn-back point.

Lay-Up
The act of storing cars of a train.

Lead
The distance between the actual point of the switch and the ½ in. point of the frog.

Lead Curve
The curve rail (also called the closure rail) in a turnout placed between the switch point and the frog.

Leading Edge
The edge of a door leading a closing movement.

Left Hand and Right Hand Seat Components
Handedness of seat components are also defined by sitting in the seat. If an armrest, for example is on the left side of the seat, then it is a left-hand armrest. Seat components that are not symmetrical and only one of which can be supplied with the seat, carry the same handedness name as the seat assembly.

Left Hand and Right Hand Seats
Seat handedness is most easily defined by sitting in the seat. If the seat is a transverse seat and the window is on the left hand, then it is a left-hand seat assembly.

Legacy System
One of the handful of North American streetcar systems which was not entirely replaced with buses, being kept in continuous service into the present day. In some cases, all or a portion of the system was upgraded to light rail standards. Legacy systems include Boston, Cleveland, New Orleans, Philadelphia, Pittsburgh, San Francisco, and Toronto.

Level of Service (LOS)
- A set of characteristics that indicate the quality and quantity of transportation service provided, including characteristics that are quantifiable (system performance, e.g., frequency, travel time, travel cost, number of transfers, safety) and those that are difficult to quantify (service quality, e.g., availability, comfort, convenience, modal image).

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- For highway systems, a qualitative rating of the effectiveness of a highway or highway facility in serving traffic, in terms of operating conditions. The Highway Capacity Manual identifies operating conditions ranging from A, for best operation (low volume, high speed), to F, for worst conditions.
- For para-transit, a variety of measures meant to denote the quality of service provided, generally in terms of total travel time or a specific component of total travel time.
- For pedestrians, sets of area occupancy classifications to connect the design of pedestrian facilities with levels of service (A for best through F for worst).
- For transit rights-of-way

Lever
A hand-operated switch for rapidly opening and closing a circuit.

Life Cycle
The acquisition and operations phases of a system's evolution. The phases of development of a system typically include the concept, design, development, production and deployment, and disposition efforts.

Lifeline[67]
A component of fall arrest system consisting of a flexible line that connects to an anchorage at one end to hang vertically (vertical lifeline) or to an anchorage at both ends to stretch horizontally (horizontal lifeline), and that serves as a means for connecting other components of a personal fall arrest system to the anchorage.

Lighting, Emergency
Lighting mode that is available whenever power for the normal lighting is unavailable. The main car battery or one or more independent power sources can be used to supply the power to operate the fixtures that provide emergency lighting.

Lighting, Night
Low intensity lighting provided on a car to allow passengers to sleep without annoyance, while still allowing sufficient light for orientation and safe passage throughout the car. Blue lamps or fixtures having blue lens are often used.

Lighting, Normal
Lighting mode that is available when the car is in operation with the normal power system.

Lighting, Standby
A lighting mode available (on some cars) when the car loses normal power, but the main car battery has not yet discharged to load shed.

Lighting Arrester
A circuit protection device designed to protect trolley electrical circuits in the event that lightning strikes the overhead contact system. Functions by shunting the high-voltage lightning charge to earth ground.

Light Rail
Light Rail is a mode of transit service operating passenger rail cars singly (or in short, usually two-car or three-car, trains) on fixed rails in right-of-way that is often separated from other traffic for part or much of the way. Light rail vehicles are typically driven electrically with power being drawn from an overhead electric line via a trolley or a pantograph; driven by an operator on board the vehicle; and may have either

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high platform loading or low level boarding using steps. Passenger stations or stops are usually farther apart than the normal spacing for streetcar systems.

Light Rail System (LRT)

A light rail system is an urban rail transit system with a "light" passenger capacity compared to heavy rail and metro systems. Its operating characteristics are that it uses rail cars, called **light rail vehicles** (LRVs), operating singly or in short multiple-unit trains on fixed rails in a right-of-way that is not necessarily grade separated from other traffic for much of the way. Light rail vehicles are almost always electrically driven, with power usually being drawn from an overhead line rather than an electrified third rail.

Light Rail Transit

A mode of rail transit characterized by its ability to operate on exclusive rights-of-way, street running, and center reservation running, and to board and discharge passengers at track or vehicle floor level. It may or may not have grade crossings with rubber-tired vehicle roadways.

Line

- A transit service operated over a specified rout or combination of routes.
- An active (in-use) railroad track or AGT (Automated Guideway Transit) guideway.
- In network coding, a route and its service level, including mode designation (type of service), line number, headway, and sequence of transfer points (nodes). These factors describe the line's route as an ordered set.
- Condition of the track in regard to uniformity in direction over short distances on tangents; or uniformity in change of direction over short distances on curves.

Linear Suspension System

The vertical force versus deflection behavior of a suspension spring system that follows a linear relationship throughout its design deflection range, such that a simple linear equation can represent deflection characteristics.

Line End

The end of any tie from which all measurements are made

Line Miles (Distance of directional roadway)

The sum of the actual physical length (measured in only one direction) of all streets, highways, or rights-of-way traversed by a transportation system (including exclusive rights-of-way and specially controlled facilities), regardless of the number of routes or vehicles that pass over any of the sections

Line, Open Wire[68]

An overhead wire line consisting of single conductors as opposed to multiple-conductors cables.

Line Side

The side of the track along which the line ends of all the crossties are evenly located in a line parallel to the centerline of the track.

Line of Sight

A method of rail vehicle operation using manual control, with vehicles operated at a speed that will allow the operator to identify, react, and stop short of any obstruction ahead. This is the typical method for operating streetcars, and for light rail when operating in street-running alignments.

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Lining Track
Shifting track laterally to conform to the established alignment.

Linkage
A mechanical arrangement for transferring motion in a desired manner.

Link Bar
A metal bar/tube used to connect rail transit vehicles together. It generally connects to the coupler yokes of the cars it is connecting, replacing the respective mechanical couplers. It is not equipped with a quick release device for uncoupling.

Load Box
A piece of wayside equipment used to provide a test load and for an HEP source to allow its performance to be measured. The equipment consists of a variable resistance load, cooling fan, load control switching, control panel and instrumentation.

Load Factor
- The ratio of used capacity to offered capacity of equipment or a facility during a specified time period. It is usually expressed as a percentage of seats occupied at a given point or (in continuous form) passenger miles (kilometers) divided by seat miles (kilometers). For rail services, the load factor is sometimes expressed as passenger miles (kilometers) per train mile (kilometer) to account for the ability to couple rail cars together to achieve efficiency.
- The ratio of passengers actually carried versus the total passenger capacity of a vehicle
- Defined as a number by which the actual or specified load is multiplied in computing the design load. The load factor shall include all applicable safety factors.

Load Shed
An electrical power system design in which some of the main battery load is disconnected partway through the discharge cycle so that the remaining battery capacity can be used exclusively to provide power to the most important loads – e.g., a portion of normal lighting, emergency lighting, and the public address system. The effect is to considerably extend the length of time these critical loads can be supported. The approach may include disconnecting such items as door operators, controls, and some of the lighting from the main battery power source.

Load Shedding
Reducing the amount of conventional transit service at peak hours by encouraging the use of para-transit operations to carry some of the peak-period passengers.

Load Weigh
Local adjustment of brake cylinder pressure based on the current weight of the vehicle.

Local Car Battery
Battery power source provided by the passenger car backup battery. This term is used to differentiate it from the backup battery, which is an integral part of the CCD.

Local Control Panel

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A panel displaying a line diagram of the trackage in and near a particular interlocking or group of interlockings, and equipped with various pushbuttons, electric switches, indicator lights, and audible alarms to allow control and monitoring of that section of trackage.

Lock

- A device, usually key operated, used in normal train operations to secure the ends of a train or portion of individual cars from unauthorized access or used to secure a door in the closed position when that door is taken out of service. Bars, latches, hasps and similar devices used to secure a car(s) for storage (overnight or long term) are not covered by this definition, as are latches and similar devices on equipment access doors.
- A mechanical device used to secure a door in the closed position when that door is taken out of service.

Lock Bar

A bar containing a locking dog that mechanically locks the switch in the full reverse or full normal position.

Lock Out/Tag Out

The use of warning tags and/or lockout devices on an energy source control when machinery or equipment is being repaired. The person who places the tag/lock is the only person who may remove it.

Lock Rod

A rod attached to the frond rod or lug, through which a locking plunger (dog) may extend when the switch points or derail are in the normal or reverse position.

Lock Rod Notch

The cut-out portion of a switch machine lock rod designated for insertion of the locking dog to mechanically lock a switch machine.

Locking

In rail systems, the electrical or mechanical establishment of a condition for a switch, interlocking route, speed limit, or automatic function which cannot be altered except by a prescribed and inviolate sequence of unlocking actions.

Locking, approach[69]

Electric locking effective while a train is approaching within a specified distance, a signal displaying an aspect to proceed and which prevents until after the expiration of a predetermined time interval after such signal has been caused to display its most restrictive aspect, the movement of any interlocked or electrically locked switch, movable point frog, or derail in the route governed by the signal and which prevents an aspect to proceed from being displayed for any conflicting route.

Locking, Detector (Occupancy)

A method of locking which prevents the movement of a track switch while the track circuit or circuits surrounding that switch is occupied by a train.

Locking, Electric[70]

The combination of electric locks and controlling circuits by means of which levers of an interlocking machine, switches, or other units operated in connection with signaling and interlocking, are secured against operation under certain conditions.

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Locking, indication[71]
Electric locking which prevents actions that would result in an unsafe condition for a train movement if a signal, switch, or other operative unit fails to make a movement corresponding to that of its controlling lever, or which directly prevents the operation of a signal, switch, or other operative unit, in case another unit which should operate first fails to make the required movement.

Locking, Moveable Bridge
The rail locks, bridge locks, bolt locks, circuit controllers, and electric locks used in providing interlocking protection at a movable bridge.

Locking, Time
Interlocking protection which prevents the position of a switch, movable point frog, or derail from being changed, until a predetermined time has elapsed after a signal governing movement over the device has been restored to "STOP" before being passed by a train for which it was "cleared. "

Locking, Traffic
Electric locking which prevents the actuation of devices for changing the direction of traffic on a section of track while that section is occupied or while the signal displays an aspect for a movement to proceed into that section.

Locking, Trailing Release Of
Locking so arranged that as a train clears a track section of the route, the locking affecting that section is released.

Locking Dog
A steel block that is automatically positioned, in the switch and lock movement, at the completion of a machine's throw to effect mechanical switch locking of the points.

Locomotive[72]
- A self-propelled unit of equipment designed for moving other equipment and includes a self-propelled unit designed to carry freight and/or passenger traffic. For rapid transit and commuter reporting, any powered unit, including a married pair, will be identified as a locomotive.
- Self-propelled - a locomotive that requires no external source of electric power for its operations.
- A piece of on-track rail equipment, other than hi-rail, specialized maintenance, or other similar equipment, which may consist of one or more units operated from a single control stand with one or more propelling motors designed for moving other passenger equipment; with one or more propelling motors designed to transport freight or passenger traffic, or both; or without propelling motors but with one or more control stands.

Locomotive Cab
- The compartment or space where the control stand is located, and which is normally occupied by the engineer when the locomotive is operated.
- The compartment or space on board a locomotive where the control stand is located, and which is normally occupied by the engineer when the locomotive is operated.

Locomotive Cab Car
Rail rolling equipment intended to provide transportation for members of the general public that is without propelling motors but equipped with one or more control stands.

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Locomotive ID Module
Locomotive-specific data shall be stored in locomotive ID module on the locomotive. The locomotive ID module shall provide data for the HEU and PSC (Power Supply Controller) in such a way that the HEU and PSC always contain the correct characteristics, parameters (constants), and other information for the locomotive on which they are placed. The locomotive-specific data shall be mechanically tied to the locomotive such that it cannot be changed inadvertently in the field even if the HEU or PSC is replaced. Format and resolution of the locomotive-specific data is given in AAR Standard S-4230, latest revision.

Lone Worker[73]
An individual roadway worker who is not being afforded on-track safety by another roadway worker, who is not a member of a roadway work group, and who is not engaged in a common task with another roadway worker.

Longitudinal
- A direction parallel to the normal direction of travel of a rail vehicle.
- Descriptive of a direction parallel to the normal direction of car travel.
- The direction in a horizontal plane parallel to the direction of travel.
- Parallel to the centerline of track.

Longitudinal Crash Pulse
A time-based acceleration curve, triangular and symmetrical in shape and having a 250-millisecond base and an 8g peak. A longitudinal crash pulse is in the direction parallel to the normal direction of travel of the car.

Longitudinal Seating
Seats that face the center aisle or side window, perpendicular to the direction of travel.

Long Warp
Warp measured at a distance equal to or greater than the distance between truck centers.

Loop
- A transit route or guideway layout that is of a closed continuous form, such as a circle.
- A terminal track layout that reverses the direction of a vehicle without the vehicle's reversing.

Looping
Looping is the process of connecting a jumper cable between two adjacent receptacles (or a fixed jumper and an adjacent receptacle) on the same vehicle. This is normally done on the exposed end of the first and last vehicles of a train and establishes the train line complete circuit. Locomotives having the F-end HEP receptacles disconnected through the use of an isolation switch use an internal loop circuit and do not require an F-end loop. When wayside power is applied via the end of the consist, the far end of the train is looped in the normal fashion, the wayside feed end is looped between left and right sides of the train and the wayside power connected with one jumper on each side of the train.

Loss-Causing
Term used to describe bodily injury, loss of life and/or property, to be defined specifically by RTA.

Lost Motion

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Motion and force that is not transmitted to the door panel due to cumulative clearances in the door operator mechanical components.

Low Energy
Electronic and protected electrical devices, one – half ampere maximum.

Low-Floor Vehicle
A light rail or streetcar vehicle with a low floor in either all or part of the interior for level boarding. Floor height in the low-floor section is typically 14 inches (355 mm) at doorways, designed to interface with a platform or raised curb of between 8 and 14 inches for boarding. Wheelchair access is provided directly or by a retractable bridge plate.

Low-Floor, Partial
- Vehicle with a low-floor in only a portion of the interior (typically 50-70%). Has internal steps to access high-floor area(s) over trucks. In this way conventional trucks and propulsion equipment can be used at the outer ends of the vehicle.
- Vehicle with a low floor in only a portion of the interior (typically 50-70% of the total length of the passenger compartment) Has internal steps to access the high-floor area(s) over trucks. In this way, conventional trucks and suspension elements can be used at the outer ends of the vehicle.

Low-Floor, 100%
- Vehicle with a low-floor throughout the interior. Has no internal steps, but floor may be ramped. Requires use of special running gear because floor structure occupies the space that would normally be used by conventional running gear.
- Vehicle with a low floor throughout the interior. A 100% low-floor vehicle as no internal steps in the passenger compartment, but the floor may be ramped. There may be a step up into the cab area. This type of vehicle requires the use of special running gear, because the floor structure occupies the pace that would normally be used by conventional running gear.

Low-Location
Area of the rail car designed by a volume whose horizontal plane includes the entire area of the floor an extending upwards a distance of four feet (1.22m).

Low-Location Exit Pathway Marking
Evacuation guidance for passengers and crewmembers when normal and emergency sources of illumination are obscured or inoperative.

Low-restraint fastener
Elastic fastener systems designed with less longitudinal rail restraint than potentially available from the fastener design. Low -restraint fasteners are applicable on tall aerial structures to reduce longitudinal load transfer to piers, thereby reducing structure construction costs.

Low Voltage Power Supply
A standalone device that created isolated and regulated DC voltages for other electronic components and devices using the system DC battery for input. Common voltages are 5, 15, 19, and 24 volts.

Lubrication
The application of lubricants, generally on a scheduled basis, to equipment and machinery.

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Luggage Rack
Any horizontally-oriented receptacle used to store passenger's luggage. Luggage racks are usually located over the passenger seating area and are secured to the car body sidewall structure.

Lubrication
The application of lubricants, generally on a scheduled basis, to equipment and machinery.

Lumen
The international unit of luminous flux or the time rate of flow of light.

Luminaire (light fixture)
A device to produce, control, and distribute light. A complete unit consisting of one or more lamps, sockets to hold and protect the lamps, optical devices to direct the light, and circuitry to provide the required electric power to the lamp(s).

Luminance
- The amount of light reflected from an area or surface or amount of light emitted from a surface, e.g., electroluminescent or LED material. English units are footlamberts (fl.). International (SI) units are candela per sq. meter and milli-candela per sq. meter.
- The amount of light reflected from a unit are or surface or the amount of light emitted from a surface, e.g., EL or LED material. English units are foot-lamberts (fl.). International units (SI) are candela per square meter (cd/m^2) (also called "nits") and millicandela per square meter (mcd/m^2). (1 fl. = 3.426 cd/m^2 or 3426 mcd/m^2).
- Amount of light (luminous flux) falling on a specific area or surface. English unites are foot-candles (fc) or lumens per square foot (Lm/Ft^2). International units are lumens per square meter (Lm/m^2) or lux (lx).

Luminance Contrast
Refers to the relationship or difference between the object and its immediate background, defined by the following ratio:

$$(L1 - L2)/L1$$

Where:
L1 = luminance of background
L2 = luminance of the object in question (e.g., lettering, pictogram, symbol)

Luminescence
- The emission of light, as in phosphorescence, fluorescence and bioluminescence, by processes that derive from essentially non-thermal sources such as chemical, bio-chemical or crystallographic changes through the excitation of the atomic system by radiation.
- The emission of light other than incandescent, as in phosphorescence or fluorescence by processes that derive from essential non-thermal sources through excitation by radiation.

Luminescent Material
Material that absorbs light energy when ambient levels of light are high and emits this stored energy when ambient levels of light are low, making the material appear to glow in the dark.

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Lux
The international unit of illuminance (1 lux = 0.0929 fc).

L/V (Lateral over Vertical) Ratio[74]
The ratio of the lateral force that any wheel exerts on an individual rail to the vertical force exerted by the same wheel on the rail.

M

Machine
A device for power operation of switches, usually dual controlled for power or hand operation.

Machine, Interlocking
An assemblage of manually operated levers or equivalent devices for the control of signals, switches, or other units, including mechanical or electric locking or both, to establish proper sequence of movements.

Machining
The removal of metal from a component using a machine tool, specifically by machine grinding or by turning.

Magnetic Farecard
A card containing a magnetic tape strip or other electronic means of indicating the value purchased. The card is usually obtained from a vending machine and must be inserted into a farecard reader to gain access to the paid area of the transit system. In some systems, the card must also be inserted into a farecard reader to exit the paid area.

Magnetic Levitation (Maglev)
Support technology that keeps a vehicle vertically separated from its track or riding surface by magnetic force, either attractive or repulsive.

Main Track
A designated track upon which trains are operated by timetable, train order or both, or the use of which is governed by block signals.

Mainline
Primary rail over which rail transit vehicles travel between stations.

Excluding:
- Yard, and
- Siding track

Mainline Derailment
A non-collision incident occurring on the mainline in which one or more wheels of a transit vehicle unintentionally leaves the rails.

Maintainability
A characteristic of design and installation which is expressed as the probability that an item will be restored to a specified condition in a given period of time, when maintenance is performed in accordance with

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prescribed procedures and resources.

Maintenance
The upkeep of vehicles, plant, machinery, and equipment. It may be scheduled, planned, progressive, or periodic on the basis of pre-established intervals of time, hours, or mileage, and employ preprinted checklists (preventive maintenance), or it may be unscheduled or corrective, in which case it is generally not interval based.

Maintenance Allocation Chart (MAC)
A chart or table used to determine what passenger rail equipment items require maintenance, what maintenance is required on those items, what type of knowledge or skill is required to perform that maintenance, what type of facility will be used to perform the maintenance, when the maintenance is required and how long each task will take to complete.

Maintenance, Corrective
The action taken to restore a failed item of equipment to an operable state.

Maintenance of Passenger Stations (123)
Component activities include:

- Inspecting, repairing and replacing components of operating station buildings and equipment;
- Providing custodial services for operation station buildings and grounds

Maintenance Planning System
A system of cost, work and manpower, planning, scheduling, and control either manual or automated and generally part of a total management information system.

Maintenance, Preventive
The actions performed in an attempt to retain an item in a specified condition by providing systematic inspection, detection and prevention of incipient failure.

Maintenance, Scheduled
Programmed preventive maintenance, usually a schedule recommended by the OEM (Original Equipment Manufacturer) or in some cases a schedule developed by the agency based on experience.

Maintenance of Way Department
That functional unit within a maintenance organization that generally has responsibility for track or guideway and structures. It sometimes includes responsibility for maintenance of all transit plant and equipment other than rolling stock.

Maintenance of Way (MOW) Shop
A transit facility expressly designed for maintenance of the plant and equipment within the jurisdiction of a Maintenance of Way Department.

Maintenance, Unscheduled
Maintenance action (unscheduled maintenance) initiated by the malfunction of equipment.

Maintenance Facility
The location within defined limits utilized by the RTA for the maintenance and repair of rail transit vehicles.

Major Accident

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An accident/incident that meets the thresholds defined in CFR 49 Part 659 sub-section 33.

Major Derailment
Any derailment occurring at a speed in excess of 10 miles per hour and/or the derailed truck(s) travel on the ground a distance of 100 feet or more.

Main Generator
That engine-driven generator (including direct current generators and alternator-rectifier combinations) whose output provides the traction power to the propulsion system. (Note: Because some models of "main generator" contain both a traction and an auxiliary portion, the term "main traction generator" is herein used where ambiguity or confusion might result.

Main Level
A level of rail transit car that contains a passenger compartment whose length is equal to or greater than half the length of the car.

Main Reservoir Equalizing Pipe
Primary means of supplying air to the friction braking system on passenger vehicles.

Malfunction
Any anomaly wherein a system, subsystem, or component fails to function as intended.

Manganese Steel Insert
A crossing in which a manganese steel casting is inserted at each of the four intersection, being fitted into rolled rails and forming the points and wings of the crossing frogs.

Manual Operation
A door capability that permits operation by hand without tools or keys.

Manual Train Control
An operating mode in which the train responds to the actions of its operator through manipulation of the brake valve or master controller.

Manually Operated
For the purpose of this document the term manually operated shall mean independently activated and deactivated by hand.

Manually Operated Door
A door which can be operated by a passenger without tools or keys using only body strength to overcome the door closer, friction, and gravity.

Marginal
A hazard severity category defined as "Category III, Marginal". Category III is defined as failure conditions which could result in minor injury, minor occupational illness, or minor system damage.

Margin of Safety
The margin of safety (MS) is defined as follows: MS = [(Allowable Stress)/ (Applied Stress)] -1.

The calculated stress shall include the applicable load actors. The allowable stress may be the ultimate stress, yield stress, critical stability stress, or fatigue stress.

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Marker
A front or rear signal of a train (flag, reflector, or lamp).

Marker Coil
A wayside, passive, electronic device installed at a precise location to convey grade, distance, and program station stop information to passing trains.

Marking
A marking is a visible notice, sign, symbol, line, or visible trace.

Master Controller
The device which generates local and train lined signals to the vehicle control system.

Matching Funds
- The intrinsic value of goods and services (work time, supplies, etc.) used to provide the required local participation for federal and state grants.
- State or local funds required by the federal government to complement federal funds for a project; also known as match or matching funds. A match may also be required by states in funding projects that are a joint state and local effort.

Maximum Authorized Speed
The maximum speed limit authorized over a defined track segment. Sometimes referred to as maximum permitted speed.

Maximum Load Point (MLP)
The point on a transit line or route at which the passenger volume is the greatest. There is one maximum load point in each direction.

Maximum Load Section (MLS)
The section of a transit line or route that carries the highest total number of passengers for that line or route and direction.

Mean Cycles Between Failures (MCBF)
The arithmetic means of the number of cycles between successive failures of a repairable device.

Mean Distance Between Failures (MDBF)
The arithmetic means of the distance traveled between successive failures of a repairable vehicle.

Mean Down Time (MDT)
The arithmetic means of the time that the device remains in an inoperable state after it has failed.

Mean Life
The arithmetic means of time to wear out of all items in the test sample or population.

Mean Maintenance Time
The arithmetic means of the time required to perform a maintenance action.

Mean Time Between Failures (MTBF)

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The arithmetic means of the time between successive independent failures, which is the mean equipment operating time per independent failure. The MTBF is the reciprocal of the failure rate.

Mean Time Between Hazardous Events (MTBHE)
The arithmetic means of the time between successive independent hazardous events.

Mean Time Between Service Failures (MTBSF)
The arithmetic means of the time between failures which interrupt or impact service operations, which is the mean revenue service time per service failure. The MTBSF is the reciprocal of the service failure rate.

Mean Time Between the Execution Of Unsafe Errors (MTBUE)
The arithmetic means of the time between software errors that produce an unsafe effect.

Mean Time Between Unsafe Failures (MTBUF)
The arithmetic means of the time between hardware failures, the occurrence of which have an adverse effect on the safe implementation of a vital UNSAFE function.

Mechanical Stabilization
A type of procedure used to restore track resistance to disturbed track following certain maintenance operations. This procedure may incorporate dynamic track stabilizers or ballast consolidators, which are units of work equipment that are used as a substitute for the stabilization action provided by the passage of tonnage trains.

Mechanical Switch Locking
An arrangement of locking bars, dogs, and other apparatus within a switch machine that locks the point in place at the end of the stroke of the switch machine.

Median
The area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way, excluding turn lanes. The median width may be different between intersections, interchanges, and opposite approaches of the same intersection.

Medical Treatment
Treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment (one-time treatment), precautionary measures such as tetanus shots, and subsequent observation of minor scratches, cuts, bruises or splinters which do not require medical care, even though these services are performed by a physician or registered professional personnel.

Megger/Megohmmeter
- A D.C. insulation resistance tester, consisting of a generator producing either 500 or 1000 volts and an ammeter scaled in megaohms.
- A precision device designed to test dielectric strength of both motor and cable insulation.

Merge Point
The section of a guideway or roadway at which two lines or lanes converge to become one.

Mid-Ordinate

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The perpendicular distance between the gage line of a rail and the midpoint of a string pulled taut and straight between two points on a curved rail.

Miles of Track
The number of tracks per one-mile segment of right-of-way (ROW). Miles of track are measured without regard to whether or not rail traffic can flow in only one direction on the track. All track is counted, including yard track and sidings.

MIL-STD-882 [75]
A military standard issued by the United States Department of Defense to provide uniform requirements for developing and implementing a system safety plan and program to identify and then eliminate the hazards of a system or reduce the associated risk to an acceptable level.

Minimum path
The route of travel between two points that has the least accumulation of time, distance, or other impedance measure.

Minor Accident
An accident/incident that doesn't meet the thresholds defined in CFR 49 Part 659 sub-section 33.

Minor Derailment
Any derailment occurring at a speed not in excess of 10 miles per hour and/or the derailed truck(s) travel on the ground a distance less than 100 feet.

Mishap
An unplanned event or series of events that result in death, injury, occupational illness, or damage to or loss of equipment or property.

Mitigation
The phase of emergency management that utilizes sustained actions to reduce or eliminate long-term risk to people and property from hazards and limits the effects of hazards. Mitigation for rail transit systems may include design considerations for safe vehicles and facilities, safety training and other activities or provisions that promote a safe operating environment.

Mixed Traffic Operations
The operation of transit vehicles on nonexclusive rights-of-way (transit ROW category C) with non-transit vehicles.

Modal Split (mode split)
- The proportion of total person trips that uses each of various specified modes of transportation.
- The process of separating total person trips into the modes of travel used.
- A term that describes how many people use alternative forms of transportation. It is frequently used to describe the percentage of people who use private automobiles, as opposed to the percentage who use public transportation.

Mode
MODE 1 (AUTOMATIC) [RAIL] - Train operation with train under ATO control with ATP monitoring and protection.

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MODE 2 (MANUAL) [RAIL] - Train operation with train under manual (Train Operator) control with operation monitored and protected by the ATP System.

MODE 3 (MANUAL WITH ATP CUTOUT) [RAIL] - Train operation under manual (Train Operator) control without ATP monitoring and protection. This mode is not permitted unless passengers are evacuated from train and an Absolute Block is established to allow train movement.

Mode, Automatic Train Operation (ATO)

That subsystem within the automatic train control system which performs any or all of the functions of speed regulation, programmed stopping, door control, performance level regulation and other functions normally assigned to the train operator.

Mode, Cab Signal

- A form of manual train control wherein the operator controls the speed of the vehicle in accordance with signal aspects displayed on the cab signal indicator.
- A form of manual train control wherein the operator controls the speed of the vehicle in accordance with the indications given by wayside signals.

Mode, Manual

An operating mode in which the train responds to the actions of its operator through manipulation of the brake valve or master controller.

Mode, Wayside Signal

A form of manual train control wherein the operator controls the speed of the vehicle in accordance with the indications given by wayside signals.

Model

- A mathematical or conceptual presentation of relationships and actions within a system. It is used for analysis of the system or its evaluation under various conditions; examples include land use, economic, socioeconomic, transportation.
- A mathematical description of a real-life situation that uses data on past and present conditions to make a projection about the future.
- Fratar (Fratar distribution) - a method of extrapolating a given distribution of trips on the basis of growth factors for the origin and destination ends. It is named after Thomas J. Fratar, the developer.
- Multiple-choice - a model that relaxes the assumption of only two possible choices and allows any number of possible choices within a given level of travel choice, such as mode, route, or time period, or among any or all of these trip characteristics.
- Sequential - a demand model that is based on the assumption that travel decisions are made in a sequence of steps, such as whether or how often to travel (trip generation), what destination to choose (trip distribution), which mode to choose (modal split), and which route to choose (trip assignment).

Monitoring

An informal activity used by system safety and safety certification staff to view an activity or process. It is informal, of short-term duration, and normally does not require a formal report.

Monobeam

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A type of guideway that consists of a single beam, usually elevated. It generally has a rectangular cross section that is usually straddled by the associated vehicles.

Monobloc Wheel
A one-piece wheel made from a single piece of steel.

Monument
A permanent marker accurately defining a point from which the track work geometry may be plotted.

Motor (electric motor)
A machine that transforms electrical energy into mechanical energy (torque).

Direct Current - an electric motor (shunt, compound, etc.) That operates on direct current.

Double-sided linear induction (DLM, DSLM) - a linear induction motor that has its active primary winding constructed so that it reacts magnetically with both sides of the guideway-mounted reaction rail (secondary winding).

Induction - an asynchronous alternating-current motor that converts alternating-current electric power, delivered to the primary winding (usually the stator) and carried as induced current by the secondary winding (usually the rotor), into mechanical power.

Linear Induction (LIM) - an asynchronous linear alternating-current motor composed of a winding in the guideway and a winding in the vehicle, one of which is energized to produce opposing magnetic fields that propel by alternately attracting and repelling the vehicle.

Linear synchronous (LSM, synchronized linear motor) - a synchronous linear alternating-current motor that supplies fixed speed operation for the powered vehicle. The fixed speed can be controlled electronically.

Series-wound - A motor in which the field circuit is connected in series with the armature circuit. It is also often called a traction motor.

Single-sided linear induction (SLM, SSLM) - a linear induction motor that has a single primary winding on one side of the secondary or reaction rail.

Shunt - a type of rotary electric motor in which the field coils are connected in parallel with the motor armature.

Traction - an electric motor, usually direct current and series wound, that propels a vehicle by exerting its torque through the wheels.

Motor Assembly
A machine component consisting of motor, pinion gear, contactor, and mounting bracket.

Motor Control Contact
A contact of a relay, switch, or other devices used to provide electrical energy to a motor or a device to be power operated.

Motor Cutout Contact
The contacts on a switch machine that open the motor circuit when a switch machine is operated in the manual mode.

Motor Cutout Contact Spring

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Tension applying device designed to ensure that motor electrical contacts, designed to remove power from the motor in the event of a jam or overload, make sufficient contact to pass electrical energy.

Mounting Force
The final force achieved during the press-fitting of two components discounting any spike force.

Movable Point
A crossing of small angle in which each of the two center frogs consist essentially of a knuckle rail and two opposed movable center points with the necessary fixtures.

Movement, Facing
The movement of a train over the points of a switch which face in a direction opposite to that in which the train is moving.

Movement, Trailing
The movement of a train over the points of a switch which face in a direction in which the train is moving.

Moving Walk support
The upper, lower, and intermediate supports needed to support the total loads of the moving walk.

Moving Walkway
A fixed conveyor device (usually a flexible belt) on which pedestrians may stand or walk while being transported

Multiple Unit (MU)
- A system of simultaneous control of all locomotive units in a consist from one master controller through the means of trainlines.
- A method of controlling the actions of the propulsion, braking, and other systems of two or more cars of the train from a single cab.

Multi Modal
Concerning or involving more than one transportation mode.

Multiple Unit (MU) Car
- A diesel multiple unit (DMU) or an electric multiple unit (EMU), with or without traction motors.
- An electric Multiple Unit (EMU), with or without traction motors, or a diesel multiple unit (DMU).

Multiplexer
A digital device that can select one of a number of inputs and pass the logic level of that input onto the output.

Multiple Unit Equipment
Equipment capable of being propelled by the use of electrical energy conducted by third rail contact shoes.

N

Name, Signal

The term used to describe the signal aspect.

National Incident Management System (NIMS):

A federally mandated standardized system designed to enable effective and efficient domestic incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

National Public Transportation Safety Plan [76]

The plan to improve the safety of all public transportation systems that receive Federal financial assistance under 49 U.S.C. Chapter 53.

National Transit Database

The Federal Transit Authority's (FTA) has developed a National Transit Database (NTD) to keep track of the industry and provide public information and statistics, and records the financial, operating and asset condition of transit systems

Near-Miss

- *Near-miss* means an incident infringing on the safety of a *roadway worker* on or near the tracks, but without contact or injury.

Source: State Safety Oversight Agency - Public Utilities Commission of the State of California, General Order No. 175-A, Section: 2. DEFINITIONS

- An unplanned event that did not result in injury, illness or damage – but had the potential to do so.

Source: OSHA and National Safety Council Alliance, NSC.

New

Any component not previously used that meets the requirements in APTA PR-M-003-98, which may be used in assemblies defined by these specifications.

Near-Side Station Stop

A station stop within the approach limits of a highway rail grade crossing.

Neck Axial Compression Criterion

Peak compressive axial (Fz) load measured at the upper neck load cell, filtered at CFC1000.

Neck Axial Tension Criterion

Peak tensile axial (Fz) load measured at the upper neck load cell, filtered at CFC1000.

Negative Bonding

Conductors of low resistance providing a path for the return propulsion current at non-insulated joints.

Negligible

A hazard severity category defined as "Category IV, Negligible", Category IV is defined as failure conditions which cause less than minor injuries, illness, or system damage.

Network

- In planning, a system of links and nodes that describes a transportation system.
- In highway engineering, the configuration of highways that constitutes the total system.
- In transit operations, a system of transit lines or routes, usually designed for coordinated operation.

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- Composite-in planning, a group of interconnected lines that represents a multi modal combination of existing and proposed transportation facilities and routes. It is often used for simulating travel patterns and determining capacities or other transportation system characteristics. Grid-1. In planning, an imaginary network of evenly spaced horizontal and vertical bars or lines that divides a study area into small geographic zones.

Network Coding
The process of abstracting details of a real transportation network and recording them in a form suitable for computer processing.

New
The condition of a component or assembly that has never operated in service.

New Rail Transit Project
A project that results in an entirely new rail transit system, extension or expansion of an existing rail transit system; major system modifications; and/or major fleet, infrastructure and/or systems modifications.

National Fire Protection Association (NFPA)
The National Fire Protection Association (NFPA) is a global nonprofit organization, established in 1896, devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards.

NFPA 10 (Standard for Portable Fire Extinguishers)
Standard issued by the NFPA covering the selection, instillation, inspection, maintenance, and testing of portable extinguishing equipment.

NFPA 130 (Standard for Fixed Guideway Transit and Passenger Rail Systems)
Standard issued by NFPA covering fire protection requirements for underground, surface, and elevated fixed guideway transit systems including train ways, vehicles, transit stations, vehicle maintenance, and storage areas, and for life safety from fire in transit stations, train ways, vehicles, and outdoor vehicles maintenance and storage areas.

No-Action Alternative (do nothing alternative, null alternative)
A planning option of leaving the situation as it already exists. Existing facilities and services are maintained, and existing transportation policies are continued.

Node
In planning, a point that represents an intersection of two or more links, highways, or transit lines or routes or a zone centroid; used in trip assignment.

Noise, Electrical
Interference produced by undesirable or casual electrical occurrences.

Noising
A transverse, horizontal motion of a locomotive that exerts a lateral force on the supporting structure.

Nominal Wheel Load (NWL)
The vertical load on the rail from a wheel when measured on level tangent track, with all the wheels of the vehicle in the same plane and vehicle stationary.

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No-Motion System[77]

- A system that detects motion of the train or vehicle.
- A system on a train that detects the motion of the train.

Non-Controlled Track

Track upon which trains are permitted by RTA rule or special instruction to move without being under an automatic train control system or receiving authorization from a train dispatcher or control operator.

Non-Linear Suspension System

The vertical force versus deflection behavior of a suspension spring system that departs from a linear relationship within the design deflection range, such that a simple linear equation does not represent deflection characteristics.

Non-Operational Consequences

Consequences that involve the direct cost of repair.

Non-Revenue Facility

A facility or an area that is not used to enable individuals to board or alight transit vehicles, and that is primarily staffed by transit employees.

Non-Revenue Vehicle

A train or other rail-mounted equipment not designated to carry passengers.

Non-Roadway Worker

An employee of an RTA or a contractor or consultant to an RTA who is not involved in the maintenance, construction, repair or inspection of an RTA rail facility but whose duties require fouling a track.

Non-Vital Logic

The software that is used in interlocking microprocessors that replaces the entrance/exit (NX) relay logic and performs non-vital functions.

Non-Vital System

Any system, the function of which does not affect the safety of train operation.

Normal Direction

The designed predominant direction of train movement as specified by the rules.

Normal Mode

On a locomotive where the prime mover drives both the traction alternator and the HEP alternator, the operating mode in which HEP is supplied by the HEP alternator.

Normal Position

The position in which a switch is aligned for train movement continuing on the same track.

Notice to Proceed (NTP)

The formal notification in which the escalator installer is notified to proceed with the project.

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Number, frog
One-half the cotangent of one-half the frog angle or the number of units of center length, of which the spread is one unit.

Number of Active Vehicles in Fleet
The total number of operational revenue vehicles in the fleet available for general public transit service, including spare or back up revenue vehicles. The total should also include any operational revenue vehicles used by contractors in general public transit service. Non-revenue service vehicles and personal vehicles should not be included.

NX Interlocking
An interlocking that uses a non-vital system of controls that automatically aligns switches and clears signals to establish interlocked routes by entrance and exit selection. The basic NX involves four non-vital logic circuits; route initiation, storage, completion, and check.

O

Occupant
A seated passenger occupying a seat placement in a normal manner.

Occupant Placement
The portion of a seat assembly that is normally occupied by a seat passenger. For example, a two-passenger seat assembly has two occupant placements.

Occupational Injury
Any injury such as a cut, fracture, sprain, amputation, etc. which results from a work accident or form an exposure involving a single incident in the work environment. The date of recordability for occupational injuries is the date on which the work accident or single incident exposure occurred.

Occurrence [78]
An event without any personal injury in which any damage to facilities, equipment, rolling stock, or infrastructure does not disrupt the operations of a transit agency.

Original Equipment Manufacturer (OEM)
- The enterprise that initially designs and builds a piece of equipment**.**
- The technical documentation produced by the organization that built or manufactured a specific piece of passenger rail equipment describing maintenance procedures and frequencies for that piece of equipment.

Off-Line
Not in the main flow of traffic or not on the main line of traffic, for example, off-line station.

Off Peak
The periods of time outside of the peak periods.

Off Set
- In transit operations, the amount of time (system- wide) that the train control computer has added into the theoretical schedule to maintain proper train sequencing, scheduled connections, and headways.

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- In traffic operations, the time difference between traffic signals as measured from some reference point.

Off-Wire Capable Vehicle

A light rail or streetcar vehicle which is capable of operating both from an external power supply (either OCS or GLPS), or from on-board energy storage. The on-board energy storage can be provided (either alone or in combination) by batteries, super capacitors, flywheel, or other means. Recharging the on-board energy storage is accomplished by capturing regenerative braking energy and by use of external power supply sources, including OCS and GLPS, while the vehicle is in motion and/or while stopped.

O & M Contractor

When applicable, the contractor(s) hired by the RTA or operating agency who is responsible for daily operations and maintenance of the rail service.

On Sight/Operation

- A requirement that train operators shall look ahead and be constantly alert for any condition that may cause injury or damage and be ready to bring the train to a safe and smooth stop. Movement must be made so as to control the movement to permit stopping within one-half of the range of vision of (a) other trains or rail equipment occupying or fouling the track, (b) obstructions, (c) switches not properly lined for movement, (d) derails set in the derailing position, (e) any signal requiring a stop, and (f) broken rail and misaligned track.
- A mode of train operation in which the operator must visually ensure that it is safe to operate a train under various operating conditions and be able to stop the train prior to any obstruction.

On-Time Performance

The proportion of the time that a transit system adheres to its published schedule times within stated tolerances; for example, a transit unit (vehicle or train) arriving, passing, or leaving a predetermined point (time point) along its route or line within a time period that is no more than x minutes earlier and no more than y minutes later than a published schedule time. (Values of 0 minutes for x and 5 minutes for y are the most common).

On-Time Trip

A trip in which the train arrives at its destination station no more than 5 minutes later than its scheduled arrival time at that station

On-the-job Training (OJT)

- Is a form of training taking place in a normal work place. Sometimes called direct instruction. It is a one-on-one training located at the job site, where someone who knows how to do a task shows another how to perform it.
- On-the-job training is one-on-one training located at the job site. It usually consists of an experienced worker passing down their skills to a new employee. This type of training is usually used for practical tasks.

On-Track Equipment

- A rail mounted vehicle or equipment that is not used in revenue service but is used to inspect, maintain, and repair the rail system.
- A rail mounted vehicle or equipment, including hi-rail vehicles and equipment, that is not used in revenue service but is used to inspect, maintain, and repair the rail system.

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On-Track Roadway Maintenance Machine[79]
A self-propelled, rail-mounted, non-highway, maintenance machine whose purpose is maintenance or inspection of railroad track.

On-Track Roadway Maintenance Machine, existing[80]
Any on-track roadway maintenance machine that does not meet the definition of "new on-track roadway maintenance machine".

On-Track Roadway Maintenance Machine, new[81]
Any on-track roadway maintenance machine that was ordered after December 26, 2003 and completed after September 27, 2004.

On-Track Safety
The practice of working in a manner that will minimize the danger of being struck by a moving RTA train or other on-track equipment, provided by operating and safety rules that govern track occupancy by personnel, trains and on-track equipment.

OP-54
- Review, analysis, and recommended procedures that FTA expects of Project Management Oversight Contractors (PMOCs) when evaluating project sponsors' readiness for service - completion of system integration testing and pre-revenue operations and management capacity and capability.
- The oversight procedure that FTA sets the PMOC expectations in regard to readiness to enter revenue operations of the FTA grantee in a new rail transit project.

Operating Agency
Purchaser, lessee, or contractor that utilizes equipment for the carriage of people.

Operating Employee
The employee of a transit system having direct and supervisory responsibility for the movement of trains.

Operating Environment
- The way equipment is used from a fire safety point-of-view. Operating environments are different only if some aspect of one environment poses a significant fire hazard or evacuation restriction.
- The way equipment is used from a fire safety point-of-view. Operating environments are different only if some aspect of one environment poses a significant fire hazard or evacuation restriction that does not exist in another operating environment, e.g., a tunnel. If significant fire hazards and evacuation scenarios are the same, then two operating environments can be adjudged the same.

Operating Hazard Analysis (OHA)
Identifies and evaluates hazards resulting from the implementation of operations or tasks performed by persons, considering: operation, test, maintenance, repair transportation, handling, emplacement or removal of the system.

Operating Ratio
The ratio of operating expenses to operating revenue; the inverse of cost recovery ration. It is used as a measure of financial efficiency.

Operating Time

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The time period between turn-on and turn-off of a system, subsystem, component or part during which time operation is as specified. Total operating time is the summation of all operating time periods.

Operations
Begins with the initiation of the completed project in service and concludes with the determination that the project has fulfilled its service requirements and must be replaced or removed from operations.

Operational Consequences
Include reduced output, schedule delay, customer service, or operating costs in addition to direct repair costs.

Operational Phase
The post construction phase where designed project function is achieved, and maintenance requirements begin.

Operational System
In system development, a system that is now available for use.

Operations Control Center (OCC)/Dispatch Center [Also referred to as Control Center]
- Central or designated regional locations of a railroad with responsibilities for directing the safe movement of trains.
- A location or locations designed, equipped, and staffed for the purposes of monitoring and controlling RTA activities from a central location or locations.
- That facility from which train control, train dispatching, and/or train supervision takes place for the entire rail transit system or for specific segments of a system if there is more than one control center. Also called rain control center, rail operations center, rail service control center, train command center.
- A central or designated regional location of a railroad with responsibilities for directing the safe movement of trains.

Operative Brake
An operative brake is an individual brake set that is fully functional. One brake set is two braked trucks.

Operator
The onboard employee who controls the movement of a train or other on-track equipment.
- An employee of a transit system whose workday is spent in the operation of a transit unit (vehicle or train); examples include rapid transit train motor operator. Such an employee may also be known as a platform operator.
- The organization that runs a transportation system on a day-to-day basis and is also known as an operation, property, or system.
- The on-board crew member controlling the operation of a rail transit vehicle. Also called the driver or engineer.

Opposing Route
Either of two routes that require opposite direction of running on the same interlocking block.

Ordinary (enclosed environment with breathing)

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Control and power devices mounted in control group enclosures or lockers. Short circuit current is limited by on-board devices.

Original Equipment Manufacturer (OEM)

- The enterprise that initially designs and builds a piece of equipment.
- The organization that built of manufactured a specific piece of passenger rail equipment describing maintenance procedures and frequencies for that piece of equipment.
- The technical documentation produced by the organization that built or manufactured a specific piece of passenger rail equipment describing maintenance procedures and frequencies for that piece of equipment.

Other Track Material (OTM)

Miscellaneous materials required to complete track construction, other than rail, special track work ballast and ties.

Outboard

Away from the centerline of the arm in either the transverse or longitudinal direction.

Out of Face (referring to track work)

Work that proceeds completely and continuously over a given piece of track as distinguished from work at disconnected points only.

Outside Agency

Any organization not directly affiliated with the RTA that may respond during a transit emergency. Examples include fire departments, police departments, utilities, hospitals, contractors with specialized equipment, and local, state, and federal government agencies.

Overhead Contact Shoe

A metal bar for collecting current from an overhead conductor along which it slides. It is held in place by a pantograph or bow.

Overhead Contact System (OCS)

- That part of the traction electrification system comprising the overhead conductors (or single contact wire), aerial feeders, overhead contact system supports, foundations, balance weights and other equipment and assemblies, which delivers electrical power for train operations.
- That part of the traction electrification system comprising the overhead conductors (or single contact wire), aerial feeders, overhead contact system supports, foundations, balance weights, and other equipment and assemblies, which delivers electrical power to non-self-powered electric vehicles.
- One or more overhead wires situated over rail tracks for the purpose of transmitting electrical energy to railcars. The wires are energized to a high electrical potential by connection to feeder stations at regular intervals.

Overlap

The distance between the control of one signal extends into the territory that another signal(s) governs.

Override[82]

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To climb over the normal coupling or side buffers and linking mechanism and impact the end of the adjoining rail vehicle or unit above the underframe.

Overspeed Control
The portion of the car borne automatic train control system which, in fail-safe manner, enforces speed limits.

Owner
The owner in control of the facility

P

Paddle Board (paddle, run card, run guide, train card)
The headway sheets (time schedule) made up for each run (operator's piece of work) that list all the pieces of work on that run (including any special notations) for the operator.

Pallet or beltway width
The horizontal distance between skit panels.

Pantograph (Pantograph Current Collection Equipment)
- The current collector apparatus, typically consisting of a linked framework, mounted on top of a rail transit vehicle.
- On a locomotive or MU car, the device that connects to the voltage supply through the catenary or contact wire to supply the power for propulsion and auxiliary systems, typically consisting of a linked framework, mounted on top of a rail vehicle.

Pantograph Gates
Gates located outside and at the end of transit cars so that when cars are coupled, their gates meet to prevent people from falling into the area between the cars.

Park and Ride (park ‘n’ ride, P&R)
An access mode to transit in which patrons drive private automobiles or ride bicycles to a transit station, stop, or carpool/vanpool waiting area and park the vehicle in the area provided for that purpose (park-and-ride lot, park-and-pool lot, commuter parking lot, bicycle rack or locker). They then ride the transit system or take a car- or vanpool to their destinations.

Parking
Fringe (peripheral parking) - a parking facility located immediately outside the central business district, where personal vehicles may be parked, and travelers may continue their trip to downtown via transit, carpool, or vanpool.

Parking Brake
- A system that is applied to prevent a stationary locomotive or car from rolling due to gravity. This shall include systems referred to as handbrakes.
- A means that supplies static braking forces to maintain a vehicle or train in a no motion state.

Parking Facility
An area, which may be enclosed or open, attended or unattended, in which automobiles may be left, with or without payment of a fee, while the occupants of the automobiles are using other facilities or services.

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Participating Outside Agency (POA)
Any organization not directly affiliated with the RTA that may respond during a transit emergency. Examples include but are not limited to fire departments; police departments; utilities; hospitals; contractors with specialized equipment; and local, state and federal government agencies.

Partition
A transverse or longitudinal panel that may enclose a room, or separate the passenger compartment from the operator's area, luggage storage area, or food service or equipment compartments.

Passageways
- A path through a vehicle to allow a passenger or crew to move from one location to another which is bordered by walls.
- A path directly bordered by walls that allows a passenger or crew member to move from one location to another.

Passenger
An individual on board, boarding, or alighting form a revenue transit vehicle. Excludes operators, transit employees and contractors.

Passenger Car[83]
Rail rolling equipment intended to provide transportation for members of the general public and includes a self-propelled car designed to carry passengers, baggage, mail, or express. This term includes passenger coach, cab car, and a MU locomotive. In the context of articulated equipment, "passenger car" means that segment of the rail rolling equipment located between two trucks. This term does not include a private car.

Passenger Car Hours
The hours that passenger cars are scheduled to or actually travel while in revenue service (actual passenger car revenue hours) plus deadhead hours.

Including:
- Layover/ recovery time

Excluding:
- Hours for charter services
- Operator training, and
- Vehicle maintenance testing

Passenger Car Miles
The miles that passenger cars are scheduled to or actually travel while in revenue service (actual passenger car revenue miles) plus deadhead miles.

Passenger Car Revenue Hours
The hours that passenger cars are scheduled to or actually travel while in revenue service.

Including:
- Layover/ recovery time

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Excluding:

- Deadhead
- Operator training
- Vehicle maintenance tests; and
- Charter services

Passenger Car Revenue Miles

The miles that passenger cars are scheduled to or actually travel while in revenue service.

Excluding:

- Deadhead
- Operator training, and
- Vehicle maintenance testing

Passenger Compartment

That portion of a rail transit vehicle designed for passenger occupancy, having vehicle end doors or interior doors, perpendicular to the vehicle sides, which separate that section of the vehicle from other vehicle sections, other passenger compartments or other vehicles. A vehicle may contain one or more passenger compartments. Open articulation sections do not separate passenger compartment but are considered a continuation of the passenger compartment.

Passenger Compartment Door

- The door opening between the main passenger compartment of the car and the car vestibule.
- For cars with end vestibules, the door opening between the main passenger compartment of the car and the vestibule.

Passenger Controls

A system of railings, booths, turnstiles, and other fixtures for collecting fares and otherwise directing the movement of passengers. The controls may also be used to maintain the distinction between fare-paid and unpaid people.

Passenger ECP (electronically controlled pneumatic) EOT (end of train)

The passenger ECP EOT performs similar functions as the freight ECP EOT with the following exceptions:

1. The EOT is not required to monitor the brake pipe.
2. The EOT is not required to include a marker light.
3. The EOT is not required to detect motion.

Passenger Equipment

All powered and unpowered passenger cars, locomotives used to haul a passenger, and any other rolling equipment used in a train with one or more passenger cars.

Passenger Information System

A system for communication audio and/or visual information to employees and passengers.

Passenger Load

The number of passengers on a transit unit (vehicle or train) at a specified point.

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Passenger Miles
Passenger Miles is the cumulative sum of the distances ridden by each passenger

Passenger Miles per Train Mile (passenger kilometers per train kilometers)
The number of passenger miles (kilometers) accomplished by a given train mile (kilometer). As an example, 100 people in one rail car of 100-passenger capacity is a load factor of 100 percent. If a car is added for ten more passengers, the load factor drops to 55 percent-yet in many ways, productivity has gone up, not down.

Passenger Mode
Service operating with passenger cars in graduated release.

Passenger Service/ in revenue
A train or passenger equipment that is carrying, or available to carry, passengers. Passengers need not have paid a fare in order for the equipment to be considered in passenger or in revenue services.

Passenger Stations
A passenger boarding/deboarding facility with a platform.

Including:
- Stairs
- Elevators
- Escalators
- Passenger controls (e.g., faregates or turnstiles)
- Canopies
- Wind shelters
- Lighting
- Signs
- Buildings with a waiting rooms, ticket office or machines, restrooms or concessions. Includes all fixed guideway (FG) passenger facilities (except for on-street cable car (CC) and light rail (LR stops), including busway passenger facilities, underground, at grade, and elevated rail stations; and ferryboat (FB) terminals. Includes transportation/transit/transfer centers, park-and-ride facilities, and transit malls with the above components, including those only utilized by motor buses (MB).

Excluding: (Stops which are typically on-street locations at the curb or in a median, sometime with a shelter, signs or lighting)
- Bus (MB)
- Light rail (LR)
- Cable car (CC)

Passenger Train [Also referred to as a Revenue Train or Revenue Vehicle]
A train carrying revenue passengers.

Passive Illumination
Illumination that is generated without the use of direct electrical energy.

Pay
Spread time premium (spread penalty, spread premium time) –

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- Extra compensation paid for work perform in excess of a specified spread time, for example, 10 hours.
- In some systems, extra compensation paid to certain employees whose duties require work during the morning and evening peak hours, with non-working release time in between. This premium pay is to compensate for the inconvenience of working a split shift.

PCC (Presidents' Conference Committee) Car

- A type of streetcar first produced in 1935. Its performance and efficiency were significantly improved over those of any streetcar previously built. The PCC car, characterized by lightweight streamlined construction, smooth and rapid acceleration and deceleration, and soft ride, became the standard for U.S. streetcars for many years. About 5,500 cars were manufactured in North America, 16,000 in Europe.
- A type of streetcar first produced in 1935. Its performance and efficiency were significant improved over those of any streetcar previously build. The PCC car, characterized by lightweight, streamlined construction; smooth and rapid acceleration and deceleration; and a soft ride, became the standard for U.S. Streetcars for many years. About 5,000 PCCs were manufactured in North America, and 15,000 in Europe.

PCC-type Streetcars

A streetcar design introduced in North America in the 1930s by the Presidents' Conference Committee of U.S. streetcar operators. More than 5,000 were built from 1936 to 1952 for U.S. and Canadian cities.

Peak (peak period, rush hours)

1. The period during which the maximum amount of travel occurs. It may be specified as the morning (a.m.) or afternoon or evening (p.m.) peak.
2. The period when demand for transportation service is heaviest.

Peak/Base Ratio (peak/off-peak ratio)

- The ratio between the number of vehicles operating in passenger service during the peak hours and that during the base period.
- The ratio between the number of passengers carried during the peak hours and that during the base period.

Pedestrian Signal-Actuating Device

A device to actuate traffic signals that is designed to be used by pedestrians.

Penalty Brake

- A function of automatic train protection portion of the master control system accomplished by a safety critical full-service or emergency brake application.
- Although most commonly associated with an overspeed operating condition, penalty brake initiated for a variety of reasons, depending on the vehicle design and the requirements of authority having jurisdiction.

People Mover

An automated transportation system (e.g., continuous belt system or automated guideway transit) that provides short-haul collection and distribution service, usually in a major activity center.
Downtown (DPM) - a people mover that primarily serves internal movements in a central business district.

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Performance Audit
In transit operations, an evaluation of a transit system's efficiency and effectiveness; a management review focusing on system's goals, objectives, and performance. A performance audit is also used to determine whether the transit agency is complying with local, state, and federal regulations on such matters as highway safety, pollution control, handicapped accessibility, and achievement of revenue-to-cost ratios.

Performance Indicator (measure of effectiveness)
A quantitative measure of how well an activity, task, or function is being performed. In transportation systems, it is usually computed by relating a measure of service output or use to a measure of service input or cost.

Performance Level (train)
A command, generally instituted by line supervision, which will vary train speed or running time from normal to achieve the desired schedule speed or headway.

Performance Target[86]
A specific level of performance for a given performance measure over a specified timeframe.

Periodic Maintenance
The performance of selected inspected and maintenance actions on systems or sub-systems. The frequency of these actions may be set by regulatory agencies or the operating authority. The frequency may be expressed as a function of time (i.e. days, weeks, or months) or in mileage or cycles. The scope of these inspection and maintenance actions must be in full compliance with all applicable federal, state, and local regulations.

Permanent Deformation
A member shall be permanently deformed if;

1. The material supplier's guaranteed minimum yield strength, or other minimum yield strength agreed to by Purchaser and Car Builder, has been reached or exceeded (for material for which the supplier only publishes a yield strength, the suppliers guaranteed minimum shall be used); or
2. The material has deformed and will not return to its original shape after the load is released.

Permissive
- A signal on which the most restrictive aspect is Stop and Proceed, or Restricting
- Train order: A signal used to indicate to a train whether or not it will receive orders
- Trimmer: A signal located, near the summit in a hump yard, which gives indication concerning movements from the classification tracks toward the summit.

Permissive Block
A block that permits a train to enter while it is occupied by another train.

Permits and Inspections
Contractor to provide licenses and permits and perform required inspections and tests.

Personal Fall Arrest System[87]
A system used to arrest the fall of a person from a working level. It consists of an anchorage, connectors, body harness, lanyard, deceleration device, lifeline, or combination of these.

Personal Protective Equipment (PPE)
All clothing and other work accessories designed to create a barrier against workplace hazards. Examples

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include safety goggles, blast shields, hard hats, hearing protectors, gloves, respirators, aprons, and work boots.

Personnel, Operating

Those employees of a transit system having direct and supervisory responsibility for the movement of trains, embodying both on-board and wayside duties.

Phantom Signal

An aspect displayed by light signal different from the aspect intended, caused by a light from an external source being reflected by the optical system of the signal.

Photoluminescent (PL) Material

- Luminous materials composed of phosphors, which when exposed to natural or artificial light absorb and store light energy; in darkness, the light is remitted as a bright glow lasting over a period of several hours. Further exposure to light for a few minutes can re-charge the phosphor. This process can be repeated without limit.
- Material having the property of emitting light that continues for a length of time after excitation by visible or invisible light has been removed (i.e., self-illuminating).

Pickup

The electrical value which, when applied to a two-state circuit or device, will cause the moving member of the device to move to the position that will just close the front contacts or visually indicated energized position, or will just cause the circuit to change its state.

Pictograms/ Pictographs

A pictorial sign or symbol. (Both words share the same meaning).

Pilot

- In rail operations, a qualified person assigned to assist train crews who are operating over unfamiliar trackage or operating unfamiliar equipment.
- On rail vehicles, a wheel guard that protects the front truck of a rail vehicle from foreign objects on the track; also known as a cowcatcher.
- A rigid device mounted under the end of a trolley or other rail vehicle in front of the trucks, designed to deflect foreign objects on the track and to prevent them from becoming caught under the wheels.
- A component of a rail transit vehicle designed to strike and deflect objects on the track to prevent the objects from getting under the vehicle's wheels and possibly causing a derailment.

Pilot Cell Voltage

The voltage of a selected cell that is assumed to be the voltage of the entire battery.

Pin Bond

A rail bond where the conductor is connected to a tapered pin that is driven into a pre-drilled hole in the rail.

Piped Rail

One with a vertical split, usually in the web, due to failure of the sides of the shrinkage cavity in the ingot to unite in rolling.

Pit

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A depressed area below floor level mainly between running rails or guideway for under-car lubrication, inspection and maintenance and equipped with all necessary utilities.

Pitting
Localized corrosion

Place of Safety
A location or condition that protects a worker from a train or other on-track equipment.

Planning
Begins with research conducted into the feasibility of a project and concludes with the creation of a concept and the decision to develop a preliminary design. This phase is managed through the local transportation planning function and proceeds through alternative analysis and special research, environmental impact assessments, corridor analyses, and major investment studies. It concludes with the formal adoption of a locally preferred alternative and the request to enter Preliminary Engineering.

Plate
Gage:
A steel plate installed on the switch tie at the switch points to secure the stock rails at the correct gage

Riser:
A steel plate welded to a special switch plate for raising the switch rail slightly above the stock rail.

Special:
Plates for use in special track work, designed to replace the AREMA standard gage, switch, heel, and hook win tie plates, commonly used under switches and frogs.

Platform (passenger platform)
That portion of a transit facility directly adjacent to the tracks or roadway at which transit units (vehicles or trains) stop to load and unload passengers. Within stations, it is often called a station platform.

Low - a platform at or near the top of the running surface of the transit unit (vehicle or train).

Far-side- A transit stop located beyond an intersection. It requires the transit units (vehicles or trains) cross the intersection before stopping to serve passengers.

Near-side- A transit stop located on the approach side of an intersection. The transit units (vehicles or trains) stop to serve passengers before crossing the intersection.

Center
A passenger platform located between two tracks so that it can serve them both.

Island
A passenger platform located between traffic lanes in the street, serving one track, as distinguished from a center platform serving two tracks. Often protected with signage and/or physical barriers for the protection of passengers.

Side
A passenger platform located to the outside of the tracks, as distinguished from a center platform located between the tracks.

Plug Door

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- A door with a mechanism that, when opening, moves the door panel(s) out and parallel to the side of the car in the open position.
- Rigid door panels that are rotated from outside the car shell when open, and into the entry way portal when closed.

Plug Tie
Rectangular sections of wood shaped somewhat like spikes, for driving into holes from which spikes have been withdrawn.

Pneumatic Backup
A pneumatic backup (PB) system shall be required on each car to apply emergency brake cylinder pressure in the event of a vented brake pipe. The PB system also shall be capable of assisting in propagating pneumatic pressure signals through the brake pipe.

Pocket
Cavity formed by the car shell outer wall and inner liner that receives door panels when open.

Point, Actual
That end of the switch rail farther from the frog, where the spread between the gage lines of the switch rail and the stock rail is sufficient for a practicable switch point.

Point Detector Rod
A device used to translate mechanical position of the switch points to the switch machine.

Point of Convergence
The location at which two transit routes meet and then continue on the same alignment.

Point of Divergence
The point at which two transit routes separate after operating over the same alignment.

Point of Extension
The point at which one transit route is lengthened from an existing route.

Point of Frog, theoretical
The point of intersection of the gage lines of a frog

Point or Switch, Actual
That end of the switch rail farther from the frog, where the spread between the gauge lines of the switch rail and the stock rail is sufficient for a practicable switch point.

Point or Switch, Half Inch
A point located at a distance from the theoretical point towards the heel equal in inches to one half the frog number, and at which the spread between gauge lines is 1/2 inch. It is the origin from which measurements are usually made.

Point-To-Point Deviation
A transit routing pattern in which the vehicle passes through pre-specified points in accordance with a prearranged schedule but is not given a specific route to follow between these points. It may provide door-

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to-door or curb-to-curb service.

Point Detector
A circuit controller which is part of a switch operating mechanism and operated by a rod connected to a switch, derail, or movable point frog to indicate that the point is within a specified distance of the stock rail.

Point Theoretical
- The point of intersection of the gauge lines of a frog.
- The point where the gauge line of the switch rail, if produced, would meet the gauge line of the stock rail.
-

Points
A movable tapered track rail, the point of which is designed to fit against the stock rail.

Poppet Valve
A valve used in electro-pneumatic equipment to apply air pressure to a device when activated.

Portable Car Jacks
Specially designed jacks (usually in a set of four) for raising a single car. May be used anywhere at floor level where built-in jacks or hoists are not warranted or cannot be installed.

Portable Jumper
A portable jumper is a form of a HEP jumper cable in which both ends are provided with plugs. This approach is taken to allow the jumper cable to be easily removed from the vehicle and moved elsewhere.

Position, De-Energized
The position assumed by the moving member of an electromagnetic device when the device is deprived of its operating current.

Position, Normal
The predetermined position in which a switch is aligned when not in use.

Position, Reversed
The opposite to normal position.

Positive Stop
The requirement that a train operator bring a train to a full and complete stop.

Post-Fault Condition
Any condition caused by a system failure that causes either repetitive faults or lockout trip of any subsystem.

Post Maul
A large sledgehammer.

Power Car
- A rail vehicle, other than a locomotive, containing a HEP source and control system. This generally takes the form of a baggage car or a car converted from a locomotive that has had the traction system removed.

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- A vehicle which serves the propulsion and/or had end power purpose(s) of a locomotive but is part of a semi-permanently coupled trainset. Typically, only one end of a power car is suitable to be attached to the train.

Power Frequency Impedance Bond

An iron core coil of low resistance and relatively high reactance used on electrified railroad to provide a continuous path for the return propulsion current around insulating joints and to confine the alternating current signaling energy to its own track circuit.

Power Operated Door

- The door equipped with a power operator which in an emergency, shall be capable of manual operation with an override device in accordance with 49 CFR Part 238.235 Doors.
- A door capability that results in the door opening or closing by means of an electric or pneumatic mechanism or a combination thereof controlled from one or more locations, and in an emergency, shall be capable of manual operation with an override device in accordance with 49 CFR Part 238.

Power, Standby

Power mode that is available (on some cars) when the car loses normal power, but the main car battery has not yet discharged to load shed. This mode is intended to keep a substantial number of the normal lighting fixtures, including emergency lighting fixtures, operating for a short period (90 seconds to 30 minutes or more) so that the short-term power outages, such as those which occur when adding cars or changing locomotives at the station, will have only a minor effect on passengers. This type of lighting power is used primarily on newer intercity passenger cars.

Power Supply

A unit that supplies electrical energy and maintains constant voltage and/or current output within in specific limits.

Power Supply Controller (PSC)

The power supply controller (PSC) shall interface with the train line communication network and control a train line power supply as commanded by the HEU. Multiple power supplies may be enabled by the HEU as described in Section 4.3. The PSC shall also com-ply with the requirements of AAR Standards S-4220, “ECP Cable-Based Brake DC Power Supply – Performance Specification,” latest revision, and AAR Standard S-4230, “Intratrain Communication Specification for Cable-Based Freight Train Control Systems,” latest revision.

Power System

The electrical devices and equipment that convert, transmit, and use power to operate a vehicle.

Power (traction) System

The substations, feeder cables, contact rails or wires, switch gear and other equipment interfacing with public utilities or other power generation equipment and providing the electrical power for the movement of the trains and the operation of their auxiliary systems.

Precision Measuring Device

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Any mechanical, electrical, electronic, or pneumatic instrument that when utilized properly provides a measurement that is used to demonstrate compliance with specified requirements.

Pre-departure Inspection

A visual and/or functional check of rail transit vehicle components or systems, performed prior to placing a vehicle or train into revenue service, conducted in accordance with local RTA procedures by a person competent to have the necessary skills and knowledge to effectively perform these tasks.

Preemption

The transfer of normal operation of traffic signals to a special control mode that interrupts the normal sequence of traffic signal phases to accommodate train operation at, or adjacent to, the traffic signal-controlled intersection.

Pre-Revenue Service Acceptance Testing Plan[88]

A document, prepared by the rail agency, that explains in detail how pre-revenue service tests of passenger equipment demonstrate that the equipment meets Federal safety standards and the rail agency's own safety requirements.

Pre-Selection

Process for testing suitable candidates for a specific operator position.

Preliminary Engineering (PE/preliminary design)

- That portion of the development of a project during which the basic planning objectives are translated into specific, well-defined criteria that can permit the final design process to begin.
- Takes the project from the planning stage to a level of design that allows a more accurate estimate of project costs and impacts. The results of PE provide the basis for subsequent funding and implementation decisions. A major objective of PE is to investigate the merits of all configurations and designs. These investigations require in-depth analysis of all components, their interrelationships, and their costs. Environmental reviews are also performed.

Preliminary Hazard Analysis (PHS)

An analysis performed to obtain an initial risk assessment of a concept or system.

Preparedness

The phase of emergency management that prepares the RTA in advance for emergency response and recovery. Preparedness for rail transit systems includes but is not limited to the development of emergency procedures and/or checklists and an emergency management plan, emergency response training, and interagency agreements.

Pre-revenue Operations

Begins with the identification and performance of tests, drills, exercises, and audits designed to verify the functional capability and readiness of the system as a whole and concludes with the verified documentation of readiness or revenue operations.

Presence Detector

A device used to detect the presence of a train in a pre-determined section of rail.

Press-Fitting

The assembly of two components using an interference fit.

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Prevailing-off Torque
Torque measured when the fastener is being removed when there is zero axial load in the assembly.

Primary Brake
The mode of braking system chosen to provide sufficient braking to meet railroad operating requirements.

Primary Exit/Primary Door Exit
The normal (preferred) door exit point (usually the end door) used by passengers and crewmembers to egress from the affected car in an emergency to an adjacent car located at either end of the affected car.

Primary Impact
- During a car crash, primary impact refers to the impact to the car itself.
- The impact between the rail car and an object, such as another rail car, during a collision.

Primary Power
The third rail or catenary power supplied to externally-powered rolling stock.

Prime Mover
An engine that provides mechanical power to drive the alternator/generator in diesel-electric vehicles or the hydraulic/mechanical transmission in diesel-hydraulic drive vehicles.

Priority
Signal priority modifies the normal highway traffic signal operation process to better accommodate train operation at or adjacent to the traffic signal-controlled intersection.

Private Accommodation
An enclosed room with a door within the passenger car equipped with seating or bedding where a person(s) may occupy the space exclusively.

Probability
- The relative frequency with which an event occurs or is likely to occur.
- In statistics, the relative Z possibility that an event will occur, as expressed by the ratio of the number of actual occurrences to the total number of possible occurrences.

Probability of a Software Error Being Unsafe (PEU)
The probability that a software error will have an unsafe effect, i.e., an adverse effect on the implementation of a vital function.

Probability That a Failure Is Unsafe (PFA)
The probability that a failure will have an unsafe effect.

Procedures
Established methods to perform a series of tasks.

Proceed Signal
A wayside or cab signal displaying any aspect which conveys an indication which permits a train to move.

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Processor-based
A system dependent upon a digital processor for proper functioning.

Procurement/Installation Phase
The phase of the system's life cycle which begins with the fabrication or construction of equipment and facilities and ends with the onset of the integration/test/checkout stage.

Productivity
The ratio of units of transportation output to units of input (consumed resource); for example, vehicle miles (vehicle kilometers) per operator hour, or passenger miles (passenger kilometers) per unit cost of operation.

Profiler/Profilometer
A precision device designed to measure commutator surfaces.

Programmable Logic Controller (PLC)
A device that controls high speed monitoring of processes electronically. Has the capabilities of a computer and programmable by factory engineers and technicians.

Program Manager
The individual in charge of the RTA program that has been assigned or delegated the duties and responsibilities for inspection, reporting and inventory of fixed structures. A licensed professional engineer who is authorized by the RTA to exercise engineering judgment; to make technical decisions with regard to the fixed transit guideway structures; and to direct qualified staff, engineering consultants or other qualified specialist to perform work. The Program Manager does not have to be a direct employee of the owner**.**

Project Manager
This person is usually employed by the RTA and designated to be in overall charge of the project.

Proof Testing
An abbreviated calibration procedure performed by the RTA that compares a shop measuring device and tools to a known calibrated standard that is traceable to NIST and verifies that the shop measuring device’s accuracy is within specified parameters.

Property (operation, operator, system)
In the transit industry, a public transit agency or a private transit company with responsibility for transportation services such as bus, ferry, rail

Proprietary
Proprietary is defined as any component having an identification number other than current APTA or former AAR catalog numbers.

Propulsion System
The motors, driving mechanism, controls, and other devices that propel a vehicle.
Duel-power - a propulsion system that is capable of operation from two different types of power sources, for example, an internal combustion engine and electricity.

Prototype System
In system development, a system that has been built to demonstrate its capability to operate in the manner intended.

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Public Address System (PA system)

- A system for communicating audio information to employees and passengers.
- A communications system within a train consist which is keyed into by a train crewmember for transmission/broadcast to/from specific locations within the train and used to provide train crew-to-passenger communication and intra-crew communication.

  Note: The system may be equipped with a selector switch to change between PA and intercom broadcast modes.

Public Transit (mass transit)

Passenger transportation service, usually local in scope, that is available to any person who pays a prescribed fare. It operates on established schedules along designated routes or lines with specific stops and is designed to move relatively large numbers of people at one time. Examples include bus, heavy rail, light rail, and rapid transit.

Pull Station

A manually activated device used to initiate a fire alarm condition.

Pulse Code Modulation (PCM) Span Line

A system that provides metallic transmission medium between two PCM multiplexed terminals and provides a transmission path for PCM carrier systems.

Public Transportation Agency Safety Plan[89]

The documented comprehensive agency safety plan for a transit agency that is required by 49 U.S.C. 5329 and this part.

Pushback

A door function that allows the door panel to be moved a specified distance in the open direction by applying a force to the leading edge.

Pushback Coupler (PBC)

- A type of coupler designed to trigger at a certain coupling speed, which absorbs a specified amount of collision energy as it is pushed back through its stroke.
- A coupler that meets all requirements and functions of traditional couplers during operation and service, but additionally incudes a retractable feature that activates at a given load and absorbs energy during a pushback.

Q

Qualification

Initial training and testing program given to employees that upon successful completion qualifies them to carry out the full scope of duties and responsibilities of the classification. Some rail agencies refer to qualification as certification.

Qualified[90]

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A status attained by an employee who has successfully completed any required training for, has demonstrated proficiency in, and has been authorized by the employer to perform the duties of a particular position or function.

Qualified Protection Employee (QPE)
An individual trained and qualified on on-track safety and operating rules and assigned the responsibility of providing on-track protection. An RTA may use another term for the person in this position. The QPE can also be referred to as the employee-in-charge (EIC).

Quality Assurance
The planned and systematic pattern of all actions necessary to provide adequate confidence that the end items will perform satisfactorily in actual operations.

Quality Control
The system of collection, analysis, and interpretation of measurements and other data concerning prescribed characteristics of a material, process, or product, for determining the degree of conformance with specified requirements.

Quantitative
Those inductive or deductive analytical approaches which are oriented toward the use of numbers or symbols used to express a measurable quantity.

R

Raceway
Any channel that is designed and used expressly for supporting wires, cables, or bus bars. Raceways consist primarily of, but not restricted to, cable trays, conduits, and wire ways.
Any channel designed expressly and used solely for holding conductors, both electrical and fiber optic.

Radius/Radial Carrier Bar
A flat steel bar mounted to the underside of a vehicle used to support the coupler assembly at the end opposite of the anchorage connection. It allows for full lateral movement within the coupler's normal range.

Radius of Curvature
A rating of the severity of a curve by comparing it to an arc of a circle of stated radius.

Rail
A rolled steel shape laid in two parallel lines to form a track for carrying vehicles with flanged steel wheels.

Other references to rail are:

Continuous welded (CWR) - a number of standard-length rails welded together into a single length of 400 or more ft (122 or more m). It provides a smoother running surface and ride than jointed rail.

Corrugated - a rough condition of alternate ridges and grooves that develops on rail tread in service.

Third (contact rail, power rail) - an electric conductor, located alongside the running rail, from which power is collected by means of a sliding shoe attached to the truck of electric rail cars or locomotives.

Fourth - an electrical conductor that provides ground return or negative return for systems in which the running rails are not used for that purpose.

High (outside rail) - the outer or super-elevated rail of a curved track.

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Low (inside rail) - the inner rail of a curve that has at-grade alignment, whereas the opposite or outer rail is elevated.

Restraining - a rail placed parallel to the inside running rail on a curve to restrain the wheel flange and reduce wear on the outside running rail.

Running - a rail that supports and guides the flanged wheels of the rail vehicle.

Standard - a 39-foot (11.89-m) section of rail.

Rail Agency
See Rail Transit agency.

Rail Anchor (anti-creeper)
A track device for ballasted track designed to prevent longitudinal rail movement (creep) caused by factors such as traffic or temperature variations.

Rail Anchorage Appliance, fixed
Often used with zero- or low-restraint direct fixation fasteners on elevated structures to prevent longitudinal movement of the rail by fixing it at one point using a special device that has a robust, usually bolted connection to the structure and the rail, similar to the “deadman” used to fix crane rails. The anchorage is placed strategically to transfer the least longitudinal load the structure while preventing any rail movement; often used to prevent the rail from “running” into a switch or other sensitives appliance such as a diamond crossing or expansion joint.

Rail Brace
A device that provides lateral support on the field side of stock rails to maintain the track gauge.

Rail Brace Backing Block
The part of a rail brace that is welded to the special switch plate.

Rail Brace Wedge
The part of a rail brace that is driven between the backing block and the stock rail, thereby securing the rail at the desired gage.

Rail Cable Clamp
A mechanical device used to secure large current carrying cables to the running rail.

Rail Clamp
A device for securing rails and frogs to special plates. Generally, this term means rigid rail clip. Colloquial use varies.

Rail, Composite Contact
An electrical conductor made of a steel rail section mounted adjacent to the running rail with an aluminum extrusion secured to each side of the steel rail web for supplying DC traction power to the transit vehicles. Sometimes referred to as “third rail”.

Rail, Continuous Welded
A number of rails welded together into a single length.

Rail, Control-cooled

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Rail cooled during manufacture at a controlled rate in an insulated container to prevent the formation of internal defects that may later result in rail breakage.

Rail Creep
Longitudinal rail movement, caused by, for example, traffic or temperature variations.

Rail Fastener
A device designed to resist lateral and longitudinal rail movement and restrain rail rotation, while providing vertical support.

Rail Fastening System
A system of components designed to resist lateral and longitudinal rail movement and restrain rail rotation while providing vertical support. In resilient fastener assemblies, the design provides electrical insulation and filtering vibrations from the rail.

Rail, Field Welded
Rail welded in track using an aluminothermy exothermic (thermite) process

Rail, Fully Heat-Treated
Control-cooled rail specially processed to produce a desired hardness throughout the rail

Rail Incident Commander
The RTA staff member responsible for managing and responding to emergencies/incidents and for acting as a liaison with emergency responders.

Rail Insulator
An insulating component between the rail clip and other rail fastener components. Atypically used to describe the component that is placed between the toe of the rail clip and rail base top; the rail insulator usually overlaps the rail edge and insulates the rail laterally between the rail and fastener shoulders or other lateral restraint protuberances.

Rail Joint
A fastening designed to unite abutting ends of contiguous rails.

Other references to rail joint are:

Bonded - A rail joint that uses high-strength adhesives in addition to bolts to hold rails together. The bonded joint may be insulated or non-insulated. On electrified track, it conducts electrical power back to the powerhouse.

Compromise - A rail joint between rails of different height and section, or rails of the same section but of different joint drillings.

Insulated - A rail joint designed to arrest the flow of electric current from rail to rail by means of insulation placed to separate the rail ends and other metal parts connecting them.

Rail Operations Employee
RTA employees either employed directly or by contract who are directly responsible for the routine movement of trains. This includes, but is not limited to, train operators, conductors, supervisors, and control center personnel.

Rail Operations Personnel

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People who met minimum qualifications for demonstrating experience in managing or directing rail transit operations.

Rail Rapid Transit System
An electrified fixed guideway transportation system, utilizing steel rails, usually operating on an exclusive grade-separated right-of-way for the mass movement of passengers within a city or metropolitan area and consisting of its fixed way, transit car vehicles and other rolling stock, power system, maintenance facilities, and other stationary and movable apparatus and equipment, and its operating practices and personnel.

Rail Rollover
The occurrence of a rail rolling about its base corner as a result of a net overturning moment applied to the rail by the combination of lateral and vertical forces acting between the wheel and rail

Rail Saw
A power machine, provided with a saw of either tooth or friction type, used to cut steel rails.

Rail Stop
A steel plate welded to a special plate to provide lateral restraint to the rail.

Rail Temperature
The temperature of the rail measured with a rail thermometer.

Rail Transit
- All forms of non-highway ground transportation that run on rail.
- All forms of non-highway ground transportation that operate on rail, including light rail, street cars, trolley, and rapid rail transit systems.

Rail Transit Supervisor
A qualified employee who has direct control over assigned staff and equipment and is responsible for the safe and efficient performance of an assigned portion of the rail transit system.

Rail Transit Agency (RTA)[91]
- Sometimes called operating system, operating authority, transit system, transit authority of rail system.
- Any entity that provides service on a rail fixed guideway public transportation system.

Other references related to RTA are:

Commuter rail: A passenger railroad service that operates within metropolitan areas on trackage that usually is part of the general railroad system. The operations, primarily for commuters, are generally run as part of a regional system that is publicly owned or by a railroad company as part of its overall service. In some areas it is called regional rail.

Dual-mode: A broad category of systems wherein vehicles may be operated in both of two different types of operation or propulsion, for example, manually steered and guided, on highways and on guideways, or with diesel and electric traction.

Heavy rail transit (HRT): See Section on Heavy Rail and also Rapid Rail

Light rail (LRT): A light rail transit system that uses exclusive right-of-way for much of its length, usually at surface grade but occasionally in tunnels or on aerial structures.

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Monorail: A transit system consisting of vehicles supported and guided by a single guideway (rail or beam), usually elevated. The basic types are as follows: supported, in which vehicles straddle the guideway or are laterally supported by it; and suspended, in which vehicles hang directly below the guideway (symmetrical monorail) or to one side of it (asymmetrical monorail). Supported monorails are stabilized by gyro, overhead rails, or lateral guidewheels on both sides of the beam (saddle monorail).

Personal rapid (PRT): A theoretical concept for an automated guideway transit system that would operate small units (two to six passengers) under computer control over an elaborate system of guideways. Off-line stations would provide demand-responsive service (except, perhaps, during peak periods) with headways of 3 sec or less. Individuals or small acquainted groups would use a unit to travel between origin and destination stations without stopping.

Pre-metro: A light rail transit system designed with provisions for easy conversion to rail rapid transit.

Rail rapid (heavy rail transit, rapid rail transit): A transit system that generally serves one urban area, using high-speed, electrically powered passenger rail cars operating in training in exclusive rights-of-way, without grade crossing (Chicago is an exception) and with high platforms. The tracks may be in underground tunnels, on elevated structures, in open cuts, at surface level, or any combination thereof. Some local terms used for rail rapid transit are the elevated, the metro, the metropolitan railway, the rapid, the subway, the underground.

Shuttle-loop (SLT): An automated guideway transit system in which transit units (vehicles or trains) operate along shuttle or loop guideways with few or no switches. It usually has on-line stations.

Streetcar (street railway, tramway, trolley system): A street transit system consisting of electrically powered rail vehicles operating in one- to three-car transit units, mostly on surface streets with mixed traffic.

Rail Transit System Engineer

A licensed professional engineer that is authorized by the rail transit system to exercise engineering judgement, make technical decisions with regard to the fixed transit guideway structures, and to direct qualified staff, engineering consultants, or other qualified specialists to perform work. The rail transit engineer does not have to be a direct employee of the owner.

Rail Transit Train

Any motorcar, locomotive or other self-propelled on-rail vehicle, with or without other cars coupled. A regular train is a train authorized by a schedule. An extra train is any train that is not in the schedule.

Rail Tread

The top surface of the rail that contacts the wheels of the rail vehicle.

Rail Vehicle

- A vehicle equipped with flanged wheels that is designed to operate on rails.
- A self-propelled vehicle equipped with flanged wheels.

Railbound Manganese Steel

A frog consisting essentially of a single manganese steel body casting fitted into and between and rolled rails and held together with bolts.

Railbus

A relatively light, diesel-powered, two-axle rail vehicle with a body resembling that of a bus.

Rail-highway Grade Crossing

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A location where one or more railroad tracks cross a public highway, road, or street or a private roadway, and includes sidewalks and pathways at or associated with the crossing.

Railroad

All forms of non-highway ground transportation that run on rails or electro-magnetic guideways, including (1) commuter or other short-haul rail passenger service in a metropolitan or suburban area, and (2) high-speed ground transportation systems that connect metropolitan areas, without regard to whether they use new technologies not associated with traditional railroads. Such term does not include rapid transit operations within an urban area that are not connected to the general railroad system of transportation.

Railroad Bridge

A structure supporting one or more railroad tracks above land or water with a span length of 12 feet or more measured along the track centerline. This term applies to the entire structure between the faces of the backwalls of abutments or equivalent components, regardless of the number of spans, and includes all such structures, whether of timber, stone, concrete, metal, or any combination thereof.

Railroad Bridge Worker / Bridge Worker

Any employee of, or employee of a contractor of, a railroad owning responsible for the construction, inspection, testing, or maintenance of a bridge whose assigned duties, if performed on the bridge, include inspection, testing, maintenance, repair, construction, or reconstruction of the track, bridge structural members, operating mechanisms and water traffic control systems, or signal, communication, or train control systems integral to that bridge.

Ramp

1. In highway systems generally, an inclined section of roadway over which traffic passes for the primary purpose of ascending or descending to make connections with other roadways. It can also be an interconnecting roadway of an interchange, or any connection between highway facilities of different elevations that vehicles may use to enter or leave a designated highway.
2. For divided highways specifically, a facility that provides access to the through lanes of freeways and expressways or connects two freeways.
3. In traffic assignment, a link that connects a freeway node and an arterial node.

Rate, Brake

The negative time rate of change of speed of vehicle as produced solely by the action of its braking system, or systems in combination.

Rate, Deceleration

The net negative time rate of change of speed of a vehicle resulting from the summation of all forces acting upon it.

Rated Capacity

The ability of the battery to deliver a stated current for a stated time under stated conditions; measured in ampere-hours.

Reaction Time

The time used by equipment, operator, or both, that elapses between the moment an action is called for and when the desired result occurs.

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Ready-to-Run (RTR)
A complete car or locomotive fully-equipped and outfitted for passenger service, including all fuel, fresh water and other onboard consumable supply volumes filled to capacity.

Rebuilt/Remanufactured vehicle
An investment of 60% or more of the replacement cost of a locomotive or coach to extend the life of that vehicle beyond its original designed useful life. Remanufacture means rebuild.

Receive Signal
Energy containing encoded information sent from transit vehicle antennas to wayside antennas.

Receiver
A device that converts radio waves into audio or visual signals.

Receiver, Track Circuit
A device on the wayside which receives track signal currents for the purpose of occupancy detection.

Receiver, Train Control
A device on a vehicle so placed that it is in position to be influenced inductively or actuated by an automatic train control or cab signal roadway element.

27-Point Jumper Cable
A cable assembly, having a 27-conductor plug on one or both ends, which is used to provide a flexible electrical connection between two cars and /or locomotives.

27-Point Receptacle
The receptacle(s) mounted on the ends of rail vehicles into which the 27-point jumper cables mate.

Receptacle, Dummy
A receptacle that is used to hold the free end of an unconnected jumper cable. The dummy may include contact(s) to establish end-of-train circuit functions for the train line, or it may be a purely passive device with no contacts.

Reconditioned
Any component that has been rebuilt and/or heat treated in accordance with this specification.

Recordable Cases
Those cases involving an occupational injury or occupational illness, including deaths. Not recordable are first aid cases which involve one-time treatment and subsequent observation of minor scratches, cuts, burns, splinters, etc., which do not ordinarily require medical care, even though such treatment is provided by a physician or registered professional personnel.

Recovery
The phase of emergency management that occurs after emergency response activities are completed and any immediate danger has passed. Recovery for rail transit systems includes but is not limited to restoration of normal operations, damage repair, debriefing, assessment of emergency response and documentation.

Rectifier Unit
A device that converts alternating current to direct current.

Red Zone

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An area surrounding working equipment, employees using tools, and lifting operations which, if entered by an individual(s), creates the potential for injury as a result of being struck by equipment, tools, or material. A red zone may specifically be defined by rule.

Reduced Speed
A speed not exceeding 15 miles per hour, at which a train can be stopped short of the next signal, another train, obstruction or switch improperly lined, looking out for broken rail or crossing protection not functioning.

Redundancy
The existence in a system of more than one means of accomplishing a given function.

Redundant Communications System
A backup system of communications to be used in the event of a failure of the primary communications system. Such redundant systems may consist of a portable radio carried by a train crew member, a cellular telephone available to a crew member or multiple hardwired radios in the consist of a train.

Reflectance Factor
The ratio of the luminous flux reflected by a body to the luminous flux it receives.

Reflection Factor
The amount of incident light returned from a particular surface.

Refresher Training
- Training that is aimed at the reinforcement and recall of previously acquired skills, abilities, and knowledge.
- Training and testing given to existing employees in a classification that, upon successful completion, maintains this qualification to carry out the full scope of duties and responsibilities of the classification. Refresher training programs may be integrated with training for changes.

Regenerative Brake
A form of dynamic brake in which the electrical energy generated by braking is returned to the power supply line, provided to on-board loads, or a combination thereof during the braking cycle.

Regular Train
A train authorized by a timetable schedule.

Regulator, Speed
An onboard vehicle subsystem, generally but not necessarily a part of the automatic train operation system, which controls acceleration and braking efforts in order for the vehicle to reach and maintain a desired speed within a desired tolerance.

Regulatory Agencies
elevator design, materials, construction clearances, workmanship, and tests shall conform to the requirements of the codes and regulations.

Regulatory Requirements
Elevator system design and installation shall comply with the version of ASME A17.1 in effect for this contract.

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Relay
A device that is operative by a variation in the conditions of one electric circuit to affect the operation of other devices in the same or another electric circuit. Commonly, an electromagnetic device to achieve this function.

Relay, Code Following
A relay which will follow or reproduce a code without distortion within practical limits.

Relay, Drop-away Level
The level of the current at which a relay armature drops to the normally de-energized state; release value.

Relay Pick-Up Level
The minimum current required to move a relay armature from one state to another when its coil is energized.

Relay, Vital
A relay, meeting certain stringent specifications, so designed that the probability of its failing to return to the prescribed state upon de-energization is so low as to be considered, for all practical purposes, nonexistent.

Reliability
Ability of a component or system to perform a known task/function for a specified interval (time, cycles, etc.). The characteristic which describes the ability of a component, subsystem or system to perform its specified function without failure and within prescribed limits, expresses as a probability or mean failure rate.

Reliability Assessment
An analytical determination of numerical reliability of a system or portion thereof without actual demonstration testing. Such assessments usually employ mathematical modeling, use of available test results, and some use of estimated reliability figures.

Reliability Block Diagram
A schematic representation which portrays system operation by showing all possible success paths.

Reliability Goal
A preset reliability objective determined by consideration of operational needs, state-of-the-art capability, cost, time, etc. The goal can be a minimum acceptable level, an expected program accomplishment or an idealistic target.

Relief Groove
A radius undercut between two adjacent seats. The purpose of relief grooves is the reduction of stress concentrations in the area between two closely sized diameters adjacent to each other.

Remanufactured Equipment
A car that has been structurally restored and has new or rebuilt components at a cost of 60% or more of vehicle replacement costs to extend its service life.

Repair
The maintenance activity which restores a failed item to an operable state.

Repeater

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An automatic relay station, generally in a high elevation, that is used to increase the range of an FM transmitter or receiver.

Replica Heritage Trolley

A new vehicle built to replicate the appearance and function of a heritage trolley (which see). For purposes of this standard, a major rebuild of a heritage trolley in which running gear and key subsystems are replaced with new equipment (i.e. only the car body is re-used), shall also be considered a replica.

Representative Car/Area

- A car/area that shares the relevant characteristics of the car(s)/area(s) it represents.
- A car/area that shares the relevant characteristics of the car(s)/area(s) it represents (i.e., same signage/marking layout, charging light system, and normal car lighting levels for passive systems or luminance/illuminance for electrically powered systems).
- A car that shares the relevant characteristics as the cars it represents (i.e., same LLEPM layout, and charging light system for passive LLEPM systems or light fixtures and power system for electrically powered LLEPM systems).

Re-qualification Training

Periodic training and testing given to employees currently qualified to ensure such employee maintains the required level of skill, knowledge and/or ability to carry out the full scope of duties and responsibilities of the classification. Some RTA refer to re-qualification as re-certification.

Reroute

To divert to a route other than the scheduled route, usually with preplanning and for a longer period than that for a detour.

Residual Hazards

Hazards for which safety or warning devices and special procedures cannot be developed or provided for counteracting the hazard which will be specifically identified to safety and program management. Continuation of effort to eliminate or reduce such hazards will be accomplished throughout the program by maintaining awareness of new safety technology or devices being developed and their application to the residual hazards. Justification for the retention of residual hazards will be documented.

Residual Risk

The risk associated with significant hazards for which there are no known control measures, no plans to control or incomplete control measures.

Resilient Fastener

A fastener, often used in direct fixation track construction, that uses am elastomer between the rail and the support of the fastener.

Resilient Wheel

A multi-piece wheel in which the tire is separated from the wheel center with resilient elements.

Resistance, Ballast

The impedance shunting a track circuit due to the condition of the ballast.

Resistance, Train Shunt

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The actual resistance in ohms from rail to rail through wheels and axles of a vehicle and the wheel/rail interface.

Resolution
Changes that are made in the system or subsystem design, procedures, or activities which eliminate or control the identified hazard to an acceptable level.

Response
The phase of emergency management that occurs once an emergency situation has been confirmed or, in some cases, when warning signs indicate that an emergency is imminent.

Restoration of Service
The resumption of service according to schedule after it has been interrupted or operating off schedule.

Restoring Feature
An arrangement on a power operated switch movement by means of which power is applied to restore the switch movement to full normal or to full reverse position before the driving bar creeps sufficiently to unlock the switch.

Restricted Speed[92]
- The allowable speed authorized, in conjunction with the line of sight rule in prescribed operating environments. This speed shall be defined in an RTA rulebook or standard operating procedure.
- A speed that will permit a train or other equipment to stop within half the range of vision of the person operating the train or equipment, but not exceeding 20 miles per hour, unless further restricted by the operating rules of the railroad.

Restriction of Work or Motion
The inability of a railroad employee to perform all normally assigned duties because of injury or occupational illness and includes the assignment of a railroad employee to another job or to less than full time work at a temporary or permanent job.

Retaining Wall Section
A portion of track roadbed elevated or depressed from the surrounding area and located between retaining walls.

Retrofit
As applied to vehicles and facilities, to furnish with new parts or equipment so as to constitute a deliberate modification of the original design (as contrasted with an overhaul or replacement-in-kind).

Retro-Reflective Material
A material that is capable of reflecting light rays back to the light source.

Revenue Miles
Miles (kilometers) operated by vehicles available for passenger service.

Revenue Seat Mile (revenue seat kilometer)
The movement of one transit passenger seat over 1 mi (km). In other words, the total number of revenue seat miles (kilometers) for a vehicle is obtained by multiplying the number of revenue seats in the vehicle by the number of revenue miles (kilometers) traveled.

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Revenue Service
Revenue Service is the operation of a transit vehicle during the period which passengers can board and ride on the vehicle. Revenue service includes the carriage of passengers who do not pay a cash fare for a specific trip as well as those who do pay a cash fare; the meaning of the phrase does not relate specifically to the collection of revenue.

Revenue Time
The hours (miles) which are comprised of running time and layover/recovery time.

Revenue Vehicle (Also referred to as a Passenger Train)
Revenue Vehicle is a vehicle in the transit fleet that is available to operate in revenue service carrying passengers, including spares and vehicles temporarily out of service for routine maintenance and minor repairs. Revenue vehicles do not include service vehicles such as tow trucks, repair vehicles, or automobiles used to transport employees.

Revenue Vehicle Miles (revenue vehicle kilometers, paid miles or kilometers)
The distance in miles (kilometers) that a revenue vehicle is operated while it is available for passenger service.

Reverser
- The portion of the master controller used to change the commanded direction of train movement.
- A circuit device used to change motor connections in order to change the direction of motor rotation and thus train movement.

Reverse Direction
Train movement in the direction opposite to the normal direction.

Reverse Move
The forward movement of a train going against the normal direction of traffic.

Reverse Running
- The operation of a train in the direction opposite to the normal direction.
- The operation of a train against the normal direction.

Rheostatic Brake
A form of dynamic brake in which the electrical energy generated by braking is dissipated as heat in on-board resistors during the braking cycle.

Ribbon Fuse
A cylindrical fuse consisting of a ribbon shaped fusible metal enclosed in a glass or transparent plastic cylinder with end caps.

Ride Quality
A measure of the comfort level experienced by a passenger in a moving vehicle, including the vibration intensity and frequency, accelerations (longitudinal, transverse, and vertical), jerk, pitch, yaw, and roll.

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Rider

- A passenger on any revenue service vehicle; also known as a patron.
- In government reporting, someone making an unlinked trip.
- **Captive:** A person limited by circumstances to use one mode of transportation.
- **Captive transit:** A person who does not have a private vehicle available or cannot drive (for any reason) and who must use transit to make the desired trip.
- **Choice:** A person who has at least two modes of travel available and selects one to use.

Ridership (patronage)

The number of people making one-way trips on a public transportation system in a given time period.

Right-of-Way (ROW)

An area at or above track level at a distance from the centerline of the track, as specified by the RTA.

- The area at track level or above rack level at a distance from the centerline of the tracks as specified by the RTA.
- The land on which the railroad track and associated structures (bridges, tunnels, signals, platforms, etc.) are located.
- All land purchased by the transit system authority for the development and operation of the system.
- Lands or rights used or held for track operation.

Right-of-Way Miles (right-of-way kilometers, first-track miles or kilometers)

The length of right-of-way occupied by one or more lanes or tracks.

Right-of-Way Work

Work performed at track level or above track level within a distance designated by the RTA of the centerline of the closest tracks.

Rigid Rail Clip

A rail clip design that does not deflect under load; an inelastic rail clip. Rigid rail clips are typically cast steel or iron blocks held by a bolt to a support base or plate. The block bottom brace bottom bac has locking serrations that engage mirror serrations in the surface of the support base or plate. Also called a rigid clamp or rigid rail clamp.

Rim

On a rail car wheel, that portion around the outer circumference that forms the edge of the tread. The thickness of the rim is a measure of the amount of wear remaining in the wheel, and when this dimension reaches a given limit, the wheel must be scrapped.

Ring Terminal

A closed loop fastener that is used to secure wire to a terminal post.

Risk

The probability of a hazardous condition occurring in a given context.

Risk Management

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An element of the system safety management function that evaluates the safety effects of potential hazards considering acceptance, control, or elimination of such hazards with respect to expenditure of resources.

Roadbed

- In railroad construction, the foundation on which the ballast and track rest.
- In highway construction, the graded portion of a highway within top and side slopes, prepared as a foundation for the pavement structure and shoulder.

Roadway

- Owned property of the RTA within the controlled area, as defined by the RTA, often referred to as "right-of-way."
- The portion of a highway improved, designed, or ordinarily used for vehicular travel and parking lanes, but exclusive of the sidewalk, berm, or shoulder even though such sidewalk, berm, or shoulder is used by people riding bicycles or other human-powered vehicles. In the even that a highway includes two or more separate roadways, the term "roadway" as used herein refers to any such roadway separately but not to all such roadways collectively.

Roadway Maintenance Machine

A device powered by any means of energy other than hand power which is being used on or near railroad track for maintenance, repair, construction, or inspection of the track, bridges, roadway, signal, communications, or electric traction systems, roadway facilities or roadway maintenance machinery on or near track or with the potential of fouling a track, and flagmen and watchmen/lookouts as defined in this action.

Roadway Worker

- Any employee either employed or by contract who performs work upon the right of way within a specified distance of tracks or in a location with the potential of fouling a track.
- Any employee of an RTA, or a contractor to a RTA, whose duties include inspection, construction, maintenance or repair of RTA track, bridges, roadway, signal and communication systems, electric traction systems, roadway facilities, or roadway maintenance machinery on or near track or with the potential of fouling a track, and other personnel directly involved with their protection. Flag persons and watchmen/lookouts are considered wayside workers.

Roadway Work Group

Two or more roadway workers organized to work together on a common task.

Roll

Motion about the longitudinal axis of a vehicle.

Roller Bearing

The general term applied to a group of journal bearings that depend upon rolling action of a set of rollers, in order to reduce rotational friction. The different types are distinguished by the shapes of the rollers and by their arrangement in the bearing. Three types of rollers are in common use at present for car journals-cylindrical, tapered, and spherical.

Rolling Radius

The rolling radius of a wheel measured as the perpendicular (radial) distance between the wheel/axle center of rotation and the point of contact with the rail. Rolling radius may vary with respect to the lateral location of the point of rolling contact.

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Rolling Radius Difference
The difference between the rolling radius of the left wheel and the rolling radius of the right wheel of a wheelset. As the wheelset is shifted laterally from its centered position between the rails, rolling radius difference will vary with respect to the lateral location of the point of rolling contact on each wheel.

Rolling Stock
Transit vehicles such as buses, vans, cars, railcars, locomotives, trolley cars and buses, and ferry boats, as well as vehicles used for support services.

Roof Handhold
Handhold located on the roof to be gripped for support when performing maintenance or inspections on the roof.

Rotary Locklift
Rotary locklift assemblies must not be used second hand.

Rotor
- The rotating member of motors, generators, or motor-type relays.
- A rotating part of an electrical machine with a shaft, usually applied to an AC machine.

Rotating Seats
Seats that are transversely mounted and can be rotated to face the front or back of a passenger rail car.

Roundhouse
A buildings circular in design, used to house locomotives while they are being serviced or repaired.

Route
- The geographical path followed by a vehicle or traveler from start to finish of a given trip.
- A designated, specified path to which a transit unit (vehicle or train) is assigned. Several routes may traverse a single portion of road or line.
- In traffic assignments, a continuous group of links that connects two centroids, normally the path that requires the minimum time to traverse.
- In rail operations, a determined succession of contiguous blocks between two controlled interlocked signals.
- The course or way traveled
- The course, way, or direction to be traveled from one controlled signal to another.
- A determined succession of continuous blocks between two controlled interlocked signals.

Route, Interlocked
A route within interlocking limits.

Route locking[93]
Electrical locking, effective when a train passes a signal displaying an aspect for it to proceed, which prevents the movement of any switch, movable point frog, or derail in advance of the train within route entered. It may be so arranged that as a train clears a track section of the route, the locking affecting that

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section is released.

Route Miles (route kilometers)

1. One-way duplicating is total mileage (kilometers) of routes, where the guideway segments of each individual route are summed up in one direction. For example, a 1-mi (km) segment over which trains operate in both directions would be reported as 2 mi (km); also known as directional route miles (kilometers) or miles (kilometers) of roadway or route.
2. One-way non-duplicating is total mileage (kilometers) of routes, where a particular guideway segment is only counted once regardless of number of routes or direction of travel on that segment; also known as line miles (kilometers) or miles (kilometers) of directional roadway.
3. Two-way mileage (kilometers) is total mileage (kilometers) of each route covered from start to finish. No attention is given to direction of routes or number of routes using any particular segment of guideway.

Route Request

The registration at an interlocking of a desired interlocked route.

Route signaling[94]

Signals indicate whether or not the train will diverge, which in turn *implicitly* indicates the speed at which the train may safely operate at the current and succeeding signals. The speed of divergences at specific locations are listed in the timetable special instructions

Route Structure

1. A network of transit routes.
2. The pattern of transit routes, for example, grid, radial.

Routes, Conflicting

Two or more routes, opposing, converging or intersecting, over which movements cannot be made simultaneously without possibility of collision.

Routing and Control Algorithm

A numerical technique for assigning trips (usually vehicle trips) to routes and controlling flows of traffic in simulation of transportation networks.

Primary Impact

Seating arrangements such that each row of seats face the same direction. Also known as theater style seating.

Rule

- In rail operations, a law or order authoritatively governing conduct or action.
- A law or order authoritatively governing conduct or action.

Rule Book [See also Handbook of Rules]

A set of codified regulations and procedures by which operating personnel are governed.

Rules

Rules are written mandatory directives issued by the RTA for its officers and authorized personnel. Rules require or prohibit specific actions, conduct, methods or procedures in connection with the employment duties and responsibilities of those officers and authorized personnel.

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Run

- The movement of a transit unit (vehicle or train) in one direction from the beginning of a route to the end of it; also known as a trip.
- An operator's assignment of trips for a day of operation; also known as a work run.
- Leader - a run that operates ahead of another run on the same route or line.
- Open (extra run) - a run that is put into effect after other runs have been assigned and that normally will be assigned from the extra board until the next picking of runs or will be put up for bid by seniority.
- Split (swing run) - two operating assignments separated by a period of time during which the operating employee is unassigned and not paid.

Run Cutting
The process of organizing all scheduled trips operated by the transit system into runs for the assignment of operating personnel and vehicles.

Run Number
That number assigned to a run for identification purposes.

Running Gear
The system of parts that provides safe motion of the vehicle along the track. Includes such components as wheels, axles (where used), suspension, brakes, traction drive, and the means to transmit traction and braking forces to the car body.

Running Hot (running sharp)
Running ahead of schedule.

Running Time
The hours (miles) the vehicle travels on the route in passenger service, typically from the beginning to the end of a route. It includes all travel and time from the point of the first passenger pickup to the last passenger drop-off, as long as the vehicle does not return to the dispatching point.

Runoff
The transition zone in lifting track, between track, which has been raised and track which has not been raised.

S

Safe
- Free from danger or loss.
- Having acceptable risk of the occurrence of a hazard.
- Secure from danger or loss

Safe Breaking Distance
The maximum distance on any portion of any track which any train, operating on such portion of railroad at its maximum authorized speed, will travel during a full service application of the brakes, between the point where such application is initiated and the point where the train comes to a stop.

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Safe Use Location
An area away from moving rail vehicles and equipment as determined by an RTA where an employee is authorized to use an electronic device.

Safety
- A reasonable degree of freedom from those conditions that can cause injury or death to personnel; damage to or loss of equipment or property; and freedom from danger.
- Freedom from danger.

Safety Assurance[95]
- A characteristic of system implementation that ensures a level of safe operation.
- Process within a transit agency's Safety Management System that functions to ensure the implementation and effectiveness of safety and risk mitigation and to ensure that the transit agency meets or exceeds its safety objectives through the collection, analysis, and assessment of information.

Safety Certification
An element of the System Safety Program that documents the functional working of the System Safety Program and provides a documented database from which to validate the active processes necessary to produce a safe system, ready for revenue service. Used primarily on new systems and expansions of operational properties.

Safety Checklist
A list for examining the safety aspects of equipment, procedures, and personnel.

Safety Consequences
Injury or death or the breach of any known safety standard or regulation. The safety impacts of this recommended change shall be evaluated pursuant to the requirements of *49 CFR 238.103, 'Inspection Testing, and maintenance Requirements'* and the organization's System Safety Plan.

Safety Critical
- A task that, if not performed correctly, increases the risk of damage to equipment or injury to a passenger, crew member or other person.
- A term applied to a system or function for which correct performance is critical to the safety of personnel and/or equipment or a system or function for which incorrect performance may result in an unacceptable risk of a hazard.
- A designation placed on a system, subsystem, element, component, device, or function denoting that satisfactory operation of such is mandatory to assurance of patrons, personnel, equipment, or facility safety. Such a designation dictates incorporation of special safety design features.

Safety Devices
Protective devices which do not alter the fundamental nature of a hazard, but which do control the extent of the hazard in some manner.

Safety Inspector
The person designated by the RTA to provide safety management services to the construction site of the project.

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Safety Management Policy[96]
A transit agency's documented commitment to safety, which defines the transit agency's safety, which defines the transit agency's safety objectives and the accountabilities and responsibilities of its employees in regard to safety.

System Management System[97]
The formal top-down, organization-wide approach to managing safety risk and assuring the effectiveness of a transit agency's safety risk mitigation. SMS includes systematic procedures, practices, and policies for managing risks and hazards.

Safety Performance Target
A Performance target related to safety management activities that is a required element of a public transportation agency's Safety Plan.

Safety Stops
- Stops made to verify the braking capability of a train to enhance safety in advance of an RTA-defined must-stop situation.
- Safety stops are the stopping of a train's movement in the yard at prescribed distance and/or locations from a fixed obstruction at the end of a track, or as when entering a maintenance facility.
- Safety stops shall be required when approaching stationary trains already occupying a track and whenever else prescribed by the RTA.

Safety Verification
An activity of safety certification. The transit authority certifies the system as safe, usually to an outside agency. Consultants or staff verify the proper functioning of processes.

Sanding
Dropping or blowing of sand or similar material on the top of the rail head to increase the coefficient of friction to obtain better adhesion.

Sampling
The process or technique of selecting a suitable sample.
Stratified (proportional sampling) - a method of sampling that sets a quota for certain classifications of the population being sampled on the basis of the proportion of each classification in the total population (universe) or of previous information about the relative distributions in these classifications.

Satellite Operations Control Center (SOCC) (Also sometimes referred to as a Backup OCC)
A designated backup location for carrying out essential functions if the existing OCC is incapacitated, threatened or in harm's way. Also called a "Backup OCC".

SCADA
System Control and Data Acquisition system to connect various pieces of equipment in a geographic area.

SCR
Silicon-controlled-rectifier; a three-lead thyristor.

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Schedule

- A listing or diagrammatic presentation in time sequence of every trip and every time point of each trip, from start to finish of service, on a transit line or route.
- In transit or railroad operations, a published table of departure or arrival times (or both) for arranged service over a transit line or route or a specific section of railroad.
- Track - a document issued on a regular basis that describes the departments and personnel that are scheduled to occupy any portion of track during the following week. Use of a track schedule is usually associated with heavy track maintenance work.

Scheduled Maintenance

Programmed preventive maintenance.

Scheduled Passenger Car Revenue Miles

The passenger car revenue miles computed from the schedule service. It includes only the scheduled passenger car revenue miles from the whole trip. It excludes:

- Deadhead;
- Service interruptions; and
- Special additional services

Scheduled Revenue Trip

Revenue service that is provided for picking up and discharging passengers on a continuing and regular basis i.e., "scheduled." A scheduled revenue trip appears on internal transit agency planning documents (e.g., run paddles, trip tickets and public timetables).

Scheduled Service

The total service scheduled to be provided for picking up and discharging passengers. Schedule service is computed from internal transit agency planning documents (e.g., run paddles, trip tickets and public timetables). Scheduled services excludes special additional services.

Scheduled Speed

The one-way distance between terminals divided by the scheduled travel time between the terminals; exclusive of layover or recovery time.

Seal

A device used to prevent gases or liquids from passing through.

Seal (tamper evident)

A device used to identify tampering and/or unauthorized access to a relay's internal components.

Sealed Battery System

A network of batteries sealed to prevent the leakage of its gas or liquid contents.

Seat

- A seat provided on trains for the comfort of seating passengers.
- The number of seats on a train is used for the purpose of calculating capacity per passenger car/per train.
- A cylindrical or conical surface onto which a component is assembled by means of an interference fit, e.g., wheel seat, bearing seat, brake disc seat.

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Seating Force
The absolute force applied to a component that is mounted against a constraint.

Seat Pitch
The distance between like features on seats facing the same direction.

Secondary Brake
Any braking mode or combination of modes used to provide braking supplemental to the designated primary braking system; not needed in order to meet railroad stopping requirements.

Secondary Exit
Exit point (usually a side door) used by passengers and crew to egress from the affected car and/or the train in an emergency if the primary exit is not available or safe.

Secondary Impact
During a car crash, secondary impact refers to the impact of passengers to features on the car or other passengers.

The impact of passengers with interior structures during a collision.

Secondary Track
A designated track upon which trains and engines may be operated without timetable authority, trains orders or block signals, subject to prescribed signals and rules and special instructions.

Secondhand
- Any used component or assembly, meeting the requirements of this specification that can be reused without reconditioning, except where noted.
- A used component or assembly that has operated in service.

Section, Dead
A section of track, either within a track circuit or between two track circuits, the rails of which are not part of a track circuit.

Sectional Release
A route locking design that allows segments of route and switch locking to be released as the appropriate track circuit become unoccupied as a train advances through a route.

Securely Fastened
Applied with steel bolts or cap screws not less than ½ inch (M12) diameter. The bolts or cap screws shall conform to one of the following specifications.

Security
Freedom from intentional danger.

Seismic Detection System
An accelerometer-based system used to detect seismic activity and produce an electrical signal output.

Selectivity
The ability of a receiver to separate two closely spaced signals.

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Self-Certification
A procedure by which a local agency assures the federal agency that all the federal rules and regulations have been followed and adhered to.

Self-Retracting Lifeline/Lanyard
A deceleration device that contains a drum-wound line that may be slowly extracted from, or retracted onto, the drum under slight tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests the fall.

Self-Revealing Failure
Failures whose effects on system operation are immediately and clearly apparent.

Semantic Differential Technique
In attitudinal research, a method of rating the emotional connotations of words and concepts by the use of adjectives paired with their opposites.

Semaphore Signal
- A signal in which day indications are given by the position of movable arm.
- A type of railroad signal whereby the daytime aspect is given by the position of a blade on an arm.

Semi-Permanently Coupled[98]
Coupled by means of a drawbar or other coupling mechanism that requires tools to perform the uncoupling operation. Coupling and uncoupling of each semi-permanently coupled unit in a train can be performed safely only while at maintenance or shop location where employees can safely get under or between units.

Sensitivity
The ability of a receiver to detect weak signals.

Separation
Wires not cabled together or run in the same conduit, raceway, tubing, junction box or cable, and not touching wires connected to a higher voltage source of energy.

Serious Injury
Any injury which:
1) Requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received;
2) Results in fracture of any bone (except simple fractures of fingers, toes or noses);
3) Causes severe hemorrhages, nerve, muscle, or tendon damage;
4) Involves any internal organ; or
5) Involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface (40 CFR Part 673.4)

Service
A system or method of providing people with the use of something, for example, transportation.

Flag stop –
1. In para-transit operations, a service accessed by hail.
2. In rail operations, a non-scheduled stop that may be served if proper notice is given by a passenger or prospective passenger.

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Local –

1. Transit service that involves frequent stops and consequent low average speeds, the purpose of which is to deliver and pick up transit passengers close to their destinations or origins.
2. Transit operation in which all transit units (vehicles or trains) stop at all stations.

Regional rail (RGR) - regional rail passenger service, usually provided by railroad agencies, that consists of electric- or diesel-powered trains on grade-separated railroad lines (sometimes with protected grade crossings); see also TRANSIT SYSTEM, Commuter rail.

Revenue –

- Transit service excluding deadheading or layovers.
- Any service scheduled for passenger trips.

Regional transit - rail transit lines with few stations and high operating speeds. They primarily service long trips with metropolitan regions, as distinguished from city transit service and short-haul transit service.

Shuttle –

- Service provided by vehicles that travel back and forth over a particular route, especially a short one, or one that connects two transportation systems or centers, or one that acts as a feeder to a longer route. Shuttle services usually offer frequent service, often without a published timetable.
- For rail and other guideway systems, a service in which a single vehicle or train operates on a short line, reversing direction at each terminal.

Service Aisles

Paved aisles in yards between storage tracks for movement of service vehicles and their personnel and equipment. Such vehicles may include electric carts, forklifts, specially designed cleaner vehicles, etc.

Service Application

Any non-emergency brake application

.

Service Attributes

Those aspects of a transportation system that affect travel decisions about its use, such as travel time, reliability, comfort (e.g., crowding, standees), cost, ease of use, and safety.

Service, Base Period

The level of transit operations during the base period.

Service Brake

The primary train brake system(s).

Service Brake Application

Any non-emergency brake application.

Service Braking (maximum)

A nonemergency brake application the obtains the maximum brake rate that is consistent with the design of the brake system, retrievable under the control of master control.

Service Dependability

The combination of reliability and maintainability characteristics of a system that describes on time system performance probability.

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Service Frequency
The number of transit units (vehicles or trains) on a given route or line, moving in the same direction, that pass a given point within a specified interval of time, usually 1 hr.

Service Volume (Also sometimes referred to as Service Capacity)
The maximum number of vehicles that can pass a given point during a specified period while a specified level of service is maintained.

Shall
- The word ***shall*** is used in standard documents to indicate mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted unless the transit system can demonstrate equivalent safety is achieved through an alternate approach.
- Used to indicate mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted unless the transit system can demonstrate equivalent safety is achieved through an alternate approach.
- Practices directed by shall are required or standard practices.

Shatter Cracks
Minute cracks in the interior of railheads, seldom closer than 1/2 inch from the surface, and visible only after deep etching or at high magnification. They may extend in any direction. They are caused by rapid (air) cooling and may be prevented from forming by control cooling the rail. Shatter cracks also occur in other steel products.

Shift (tour of duty, stint, trick, turn)
A part of the daily working schedule of a transit system or its employees.

Shim
A small piece of wood or metal placed between two members of a structure to bring them to a desired relative elevation.

Shoe
A cast steel or elastomer (or combination of steel and elastomer) component between the top of the rail base an elastic rail clip. The shoe shape conforms to the rail base top and side, with interlocking shapes (dogs) to the fastener body, shoulder or plate design. See also rail insulator.

Shoofly
A temporary track to allow rail operations to bypass construction activities.

Short Looping
Short looping is the process of looping the HEP jumpers at points other than the ends of the train. This is used in an emergency situation such as overcoming a damaged jumper on the road, to bypass an open trainline complete circuit on one side of the train.

CAUTION – When short looped, vehicles behind the short loop site do not have the Train Line Complete (TLC) indication or control interlock at the HEP controls, even though the 480VAC circuits may be live.

Short Ton (U.S. Short Ton)
2,000 lbs.

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Short Warp
Warp measured between any two points within 10 ft along a section of track.

Should or May
- Practices directed by should or may are recommended practices.
- Used in recommended practice documents to indicate that, among several options, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not required.

Shoulder
That portion of the ballast between the end of the tie and the tow of the ballast slope.

Shrink-Fitting
Fitting accomplished by heating or cooling a component to a temperature sufficient to temporarily create a clearance between the bore of the component and the seat onto which it will be assembled.

Shunt[99]
- A bypass in an electrical circuit.
- A by-path in an electrical circuit.
- A device installed from one running rail to the other.
- Hard: used to short circuit current between the transmitter and receiver of a track circuit.
- Soft: Used to limit the current flow between transmitter and receiver by using a resister that represents the worst-case shunting value of a train consist axel shunt.

Shunt Circuit
A low-resistance connection across the source of supply, between it and the operating unit.

Shunt Device
A device that provides a by-path from rail to rail in a track circuit. This device typically simulates the presence of a train to the signaling system.

Shunting Impedance
Impedance between rails presented by a train's wheels and axles and the wheel/rail interface.

Shunting Sensitivity (track circuit)
The maximum impedance in ohms which, when placed at the most adverse shunting location, will cause the track circuit to indicate the presence of a train.

Side Door Handhold
Handhold located on the side of the car above a side door step.

Side Door Step
Step or stirrup located on the side of the car to assist an employee in entering or leaving a side door entrance.

Side Entrance Door
The door opening(s) on the side of the car normally used for passenger access and egress.

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Side Sill
The outside longitudinal member of the underframe.

Siding (passing track, side track) [100]
- A track adjacent to a main or a secondary track, for meeting, passing, or storing cars or trains.
- A track auxiliary to the main track for meeting, passing, or storing trains.

Sign
- A display board, poster, or placard using text and/or graphics to convey information or direction.
- A notice for giving directions or warning.

Sign-up (bidding runs, mark-up, operator pick, pick, run pick, run picking, shake-up)
The procedure by which, at regular intervals or when new service or realignments of service are implemented, operators select their regular assignment for an upcoming period (typically several months). The order of selection is usually by operator seniority and is usually specified in union contracts.

Signal
- A means of communicating direction or warning.
- An appliance that conveys information governing train movement.
- A signal at a fixed location that indicates a condition that affects the movement of a train.

Signal, Approach
- A fixed signal used in connection with one or more signals to govern the approach thereto.
- A roadway signal used to govern the approach to another signal and if operative so controlled that its indication furnishes advance information of the indication of the next signal.

Signal Aspect (See also Aspect)
The appearance of a fixed signal conveying an indication as viewed from the direction of an approaching train. The appearance of a cab signal conveying an indication as viewed by the operator in the cab.

Signal, Audible
A sound-producing device used for attracting attention.

Signal, Automatic
- A signal that is controlled automatically by certain conditions of the track section that it protects.
- A signal activated without need for manual action.

Signal block
A fixed signal at the entrance to a block to govern trains entering that block.

Signal Bonding
Rail connection providing a low resistance path for track circuit current.

Signal, Bumping-Post
A signal to advise that a bumping post at a temporary or permanent end of the track is ahead.

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Signal, Cab[101]

- A signal in the engineer's/train operator's cab which conveys the automatic block aspects and indicates the prevailing speed command.
- A signal located in engineman's/train operator's compartment or cab, indicating a condition affecting the movement of a train and used in conjunction with interlocking signals and in conjunction with or in lieu of block signals.

Signal Call-On

An interlocked signal aspect which permits a train to enter an occupied block at restricted speed.

Signal, Cleared

A signal which has been caused to display an aspect to proceed.

Signal, Color Light

Signals which display aspects by means of lighted color lenses.

Signal Department

The function within a maintenance organization responsible for the transit system's signal system. Sometimes combined with a Power Department.

Signal, Dwarf

A low home signal.

Signal Equipment Room

A train control room, relay room, bungalow, or hut located in a passenger station or yard or at some other strategic point to house signal equipment.

Signal Equipment Room Drawing

A combination of drawings that includes signal schematics, plant layout, equipment location, track plans, and information for other signal equipment controlled from the signal equipment room.

Signal, Fixed

A signal of fixed location along the track right-of-way.

Signal, Flashing Light

A highway crossing signal, the indication of which is given by two horizontal red lights-flashing alternately at predetermined intervals, or a fixed signal in which the aspects are given by color and by the flashing of one or more of the signal lights.

Signal, Hand

A manual signal used to govern the movement of trains.

Signal, Home[102]

- A fixed signal at the entrance to a route or block to govern trains entering that route or block.
- A roadway signal at the entrance to a route or block to govern trains in entering and using that route or block.

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Signal, Impulse
An automatic signal, not displaying a visible aspect, "read" and automatically responded to by on-car equipment, thereby regulating train movement.

Signal, Indication
The information conveyed by the aspect of a signal**.**

Signal, Interlocking[103]
A wayside signal which governs movements into or within interlocking limits.

Signals, opposing[104]
Roadway signals which govern movements in opposite directions on the same track.

Signal Preemption
In highway operations, an automatic or manual device for altering the normal signal phasing or the sequence of a traffic signal to provide preferential treatment for specific types of vehicles, such as trains.

Signal, Proceed
A wayside or cab signal displaying any aspect which conveys an indication which permits a train to move.

Signal, Stop
A signal which displays the most restrictive aspect. A wayside signal aspect conveyed by one or more red lights, by semaphore arms in a horizontal position, or the absence of lights from a bare lamp, or a cab signal displaying the word "STOP" and a zero-speed command.

Signal System Snow Melting Equipment
Equipment used for the sole purpose of melting snow and ice that may interfere with signal system operation.

Signal, Time
A signal which controls train speed by requiring that a certain time elapse in an approach block.

Signal, Wayside
A signal of fixed location along the track right-of-way.

Signals, Opposing
Wayside signals which govern train movements in opposite directions on the same track.

Silicon-Controlled-Rectifier (SCR)
A three-lead thyristor.

Sill Step
Step or stirrup located on the side, near the end of the car to allow an employee to ride on the side of the car during switching moves.

Sill Step Handhold
Handhold located on the side of the car above a sill step.

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Simulation
A process or technique in which real phenomena, such as vehicle or person movements, are represented mathematically to allow study for planning purposes.

Single Command
A chain of command used in the ICS in which a single incident commander (IC) has overall responsibility for the management of an incident or emergency when the event overlaps one or more jurisdictions.

Single Ended
A vehicle with an operating cab at one end; also called unidirectional.

Single Point Failure
A causal factor whereby failure at, or by, a single point or component can create a Catastrophic (Cat I) or Critical (Cat II) hazard. Single point failures are to be eliminated by design.

Single-Sided
Vehicle with doors on only one side. Such vehicles are typically also single-ended.

Single Track
A main track upon which trains are operated in both directions.

Single Unit
A self-contained transit vehicle capable of running as a single car opposed to a married-pair. The car may have a control cab on one end, both ends, or none at all. These cars are easily and quickly connected to and disconnected from other cars.

Skip Stop
An operating procedure in which a train intentionally passes through a station without stopping.

Slid Flat
A wheel defect caused by skidding or sliding, resulting in a flat spot on the wheel tread.

Slide (Wheel)
The condition wherein the wheel tread speed is less than train speed.

Slide Plate
A flat plate contained in the switch layout that provides a surface for the movement of the switch points from one position to the opposite position.

Slip (Wheel)
The condition wherein the surface spread of wheel tread is greater than the train speed.

Slip Joints
Sliding joints required to support escalators in transportation system and high-rise applications. They can be located at the top or bottom support areas but are generally located at the platform level or as indicated on the contract drawings.

Slip Ring
A conducting ring rotating with a winding and connected thereto and serving to make a connection with an external circuit by means of a brush or brushes.

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Slip-Slide System
An onboard system for detecting and correcting wheel slips and slides

Slip Switch
- A combination of a crossing with one right-hand and one left-hand switch and curve between them within the limits of the crossing and connecting the two intersecting tracks without the use of separate turnout frogs.
- A combination of a crossing and a single connecting track that is located within the limits of the crossing and is made up of a right-hand switch from the one track and a left-hand switch from the other track which unite to form the connecting track without additional frogs.

Slow Order
A location where trains must temporarily travel more slowly than maximum authorized track speed for that location.

Slow Speed
- Speed developed by an individual RTA to temporarily reduce the speed of the train.
- A speed not exceeding 15 miles per hour, except in ASC (Automatic Signal Control) territory train will be governed by speed displayed on cab signal indicator, not to exceed 35 miles per hour.

Snap-hook
A connector comprised of a hook-shaped member with a normally closed keeper, that may be opened to permit the hook to receive an object and, when released, automatically closes to retain the objects.

Snow Brake
Means of applying a light brake cylinder pressure on a vehicle to prevent the accumulation of ice and snow between the friction material and the braking surface.

Snubber
A friction or hydraulic device used to damp oscillations, also known as a shock absorber or damper (e.g., truck-to-bolster yaw oscillations).

Social Mitigation
Passenger awareness programs, education on self-protective measure for both passengers and employees, and other situational or procedural measures.

Solid Manganese Steel
- A crossing in which the frogs are of the solid manganese steel type.
- A frog consisting essentially of a single manganese steel casting.

Spacing
The distance between consecutive vehicles, measure front to front.

Spall
An area of concrete that has broken, chipped or become pitted.

Spare Vehicles
The revenue vehicles maintained by the transit agency to:

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- Meet routine and heavy maintenance requirements;
- Meet unexpected vehicle breakdowns or accidents; and
- Thereby preserve scheduled service options

Spatial Average

- The average of all samples taken in the vicinity of a specific location.
- The average of all samples taken in the vicinity of a specific location. The area of a spatial average varies. For a stairway, it includes only the area of the stair step(s). For an aisle, the entire length of the aisle is included.

Special Gauging

Gauges used to verify OEM specifications. A special gauge may be considered a precision measuring device.

Special Test Equipment

Any portable test unit, rack, or equipment required for use on the equipment being delivered under contract, and/or any PTU or test equipment not currently and commonly in use on the railroad.

Special Tool

- A customized tool fabricated, purchased, or supplied for a specific purpose. A special tool may be considered a precision measuring device.
- Any tool that is not a common hand tool and is not commonly available to railroad maintenance employees.

Specific Gravity

- The ratio of the density of a solid or liquid to the density of an equal volume of distilled water at 39°F (4°C) or the density of a gas to that of air or hydrogen under prescribed conditions of temperature and pressure.
- The ratio of the density of a solid or liquid to the density of an equal volume of distilled water.
- For solid or liquid, the ratio of the density of the solid or liquid to the density of an equal volume of distilled water at 39°F (4°C). For gas, the density of the gas to that of air or hydrogen under prescribed conditions of temperature and pressure.

Speed

- Overall trip (effective operating speed, cycle speed) - in transit operations, the average speed achieved per round trip, including layover time but excluding deadheading time. It is calculated by individual trips, by running time periods, or for the entire schedule.
- Running - the highest safe speed at which a vehicle is normally operated on a given roadway or guideway under prevailing traffic and environmental conditions; in some areas, also known as operating speed.
- Schedule - the one-way distance between terminals divided by the scheduled travel time between the terminals.

Speed, Car Wash

The speed prescribed for cars to move through a car wash; usually an automatic feature in the train control circuitry.

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Speed Command
That speed limit being imposed upon a train at a given point in time by the automatic train control systems.

Speed Controlled Engine or Train
An engine or train equipped with speed control apparatus, including cab signal indicator, sealed application valve or switch, audible warning device and acknowledging switch, in operative condition for the direct in which it is to move.

Speed Flow Relationship
The relationship between the flow (volume) of units on a transportation facility and the speed of those units. As flow increases, speed tends to decrease.

Speed Limit
A prescribed maximum speed.

Speed Limit, Civil
The maximum speed allowed in a specified section of track as determined by physical limitations of the track structure, train design, and passenger comfort.

Speed Limit, Safety
The maximum speed at which a train can safely negotiate a given section of track under the conditions prevailing at the time of its passage.

Speed, Limited
A speed limit established by individual railroads but not, per the AAR Standard Code, to exceed a specified limit.

Speed Maintaining
The automatic action of a speed regulator.

Speed, Maximum Authorized
The highest speed limit which is authorized.

Speed, Medium[105]
A speed limit established by individual railroads but not, per the AAR Standard Code, to exceed 40 mph.

Speed Profile
A plot of speed against distance traveled.

Speed Recorder
A device for continuously recording the speed of a train.

Speed, Reduced
Proceed prepared to stop short of train or obstruction.

Speed Regulation
The automatic action of a speed regulator.

Speed Regulator
An onboard vehicle subsystem, generally but not necessarily a part of the automatic train operation system,

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which controls acceleration and braking effort in order for the vehicle to reach and maintain a desired speed within a desired tolerance.

Speed, Restricted[106]

- Proceed prepared to stop short of train, obstruction, or switch not properly aligned, and to look out for broken rail, at a speed established by individual railroads but not, per the AAR Standard Code, to exceed 20 mph.
- A speed that will permit stopping within one-half the range of vision, but not exceeding 20 mile per hour.

Speed, Schedule

The speed called for to comply with the timetable.

Speed Sensor

A device which detects axle, gear, or motor speed, and produces a signal at a frequency proportional to that speed.

Speed signaling[107]

Signals that *explicitly* indicate the speed at which the train may safely operate at the current signal and sometimes at succeeding signals. They do not specifically convey information about the route at locations where there are options for a diverging route, (e.g. via a switch at a junction).

Speed, Slow[108]

A speed established by individual railroads but not per the AAR Standard Code, to exceed 20 mph.

Speed, Yard

A speed, used within yard limits, that will permit stopping within one-half the range of vision.

Spike

The force applied to a press-fitted component after that component has contacted a restraint. The restraint may be a shoulder, fillet, or a previously fitted component that is constrained. The magnitude of the spike is the difference between the maximum force applied after contacting the constraint and the force applied immediately before contacting the restraint.

Spin Test

A diagnostic procedure typically used to detect anomalies that are not apparent when inspecting stationary motors, gear drives, and wheel sets. Wheel sets are jacked off the running rail and rotated under no load conditions (or "spun") either through resistance control of traction power line voltage or by utilizing a testing device supplying low voltage or low frequency. A low-voltage power supply is connected to DC traction motors, usually at the motor lead plug and receptacle quick disconnect. For induction motors, a variable-voltage, variable frequency or fixed low-frequency power supply is required.

Spiral (when used with respect to track)

A form of casement curve in which the change of radius is uniform throughout its length.

Split Web

A longitudinal or diagonal transverse crack in the web of a rail.

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Spotboard
A sighting board placed above and across the track at the proposed height to indicate the new surface and ensure its uniformity.

Spot Replace
Repair or replacement of the specific unserviceable parts found defective in an assembly.

Spotting
Placing a train in a designated or specific location for loading or unloading.

Spread, Maximum
The largest permissible spread time for an operator, as specified in a labor contract or agreement.

Spring
A switch in the operating mechanism of which is incorporated a spring device so arranged as to automatically return the points to their original or normal position after they have been thrown over by the flanges of trailing wheels passing along the other track from that for which points are set for facing movements.

Spring Switch
A switch equipped with a spring mechanism arranged to restore the switch points to normal position after having been trailed.

Squelch
A circuit within a radio that keeps the speaker silenced until the signal level exceeds a certain point.

SRP
Seat Reference Point as given by SAE AS8049. Based on 50^{th} percentile male.

Stability Taper
A single weighted value based on a linear representation of the wheel tread taper across the running surface of the wheelset as the wheelset is shifted laterally in both directions from its centered position between the rails.

Stairway
Continuous set of steps (not interrupted by a landing).

Staggered Polarity
The method of alternating negative and positive ac polarities at insulated joints for the purpose of detecting defective insulated rail joints to prevent feed through of a voltage into an adjacent track circuit that could create an unsafe condition.

Stanchion
An upright handhold which extends from floor to ceiling, and is mechanically attached to the floor, ceiling or wall.

Stand
A device for manual operation of switches.

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Standard
A document or drawing containing mandatory requirements on "how" an action or feature should be implemented. It may be adopted as law.

Standard Times
The average times required to perform a given maintenance or operations task. These times are usually estimated originally and constantly refined to reflect experience and progress. They are a measure of production and most useful in estimating personnel, material and budget requirements, as well as for cost control.

Standard Error of Estimate
A statistical measure of the possible differences between the actual and estimated values of a variable.

Standard Maintenance Procedure (SMP)
- The internal railroad document giving specific instruction on how to perform maintenance on a specific system or compound.
- Unique to rail agencies with reference to maintenance procedures.

Standard Operating Procedure (SOP)
Unique to rail agencies with reference to operating procedures.

Standby Mode
On a locomotive where the prime mover drives both the traction alternator and the HEP alternator, the operating mode in which HEP is supplied by the traction alternator. In this mode, the locomotive cannot supply traction power. This mode is used primarily in terminals since the engine should consume less fuel and generate less noise when operating in this mode, as it operates at a lower speed than in Normal Mode.

State of Good Repair
A condition sufficient for capital assets to operate at a full level of performance. This means that asset:
1. Is able to perform its designed function
2. Does not pose a known unacceptable safety risk, and
3. Has met or recovered lifecycle investments

Static Coefficient of Friction
The ratio of the magnitude of the maximum force of static friction to the magnitude of the normal force.

Station
- A railway facility where trains regularly stop to load and unload passengers which generally consists of a platform next to the track and a station building providing related services such as ticket sales, waiting areas, passenger information, etc.
- An off-street facility where passengers wait for, board, alight, or transfer between transit units (vehicles or trains). A station usually provides information and a waiting area and may have boarding and alighting platforms, ticket or farecard sales, fare collection, and other related facilities. It is also known as a passenger station.
- The location to which operating employees report and from which their work originates.
- In transportation planning, the location along a cordon line at which interviews are made.

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- In railroad operations, a place designated in the timetable by name, at which a train may stop for traffic or to enter or leave the main track, or from which fixed signals are operated.
- A place designated for the purpose of loading and unloading passengers.

Station, Above Ground
A station in which the track and platform are either located on an aerial structure or rest directly on grade.

Station Operations Employee
Term used to describe rail transit station operations personnel Station Managers, Customer Assistants, Station Clerks or the like.

Station Personnel
- RTA employees whose primary duties may include but are not limited to, handling station activities, providing customer service, and performing other operational requirements.
- Rail transit system employees whose primary function is to provide customer service in rail stations. They are variously referred to as cashiers, station agents, customer assistants, or station managers.

Station, Underground
A station in which the major portion of the structure is located below the finished grade – a subway station.

Stator
The fixed part of an electrical machine. A base or other support or suspension elements, if provided, is not ordinarily considered to be part of the stator.

Steel Wheel
In rail systems, the specially designed case of forged steel, essentially cylindrical element that rolls on the rail, carries the weight, and provides guidance for rail vehicles. The wheels are semi-permanently mounted in pairs on steel axles and are designed with flanges and a tapered tread to provide for operation on track of a specific gauge. The wheel also serves as a brake drum on cars with on-tread brakes.

Step Width
The horizontal distance between skirt panels.

Stinger
An electrical device, usually on an overhead trolley used for applying traction power to vehicles in a shop for testing or moving these vehicles. Some shops use external means of moving vehicles, such as locomotives, track mobiles, or hi-rail vehicles.

Stock Rail
- The rail against which the point of a switch, derail, or moveable point frog rests.
- The rail that the point of a switch, derail, or moveable point frog rests against.

Stop
Mid-block- A transit stop located at a point away from intersections.

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Stop, Absolute
A signal indication which requires a train to stop and stay stopped.

Stop and Proceed
A signal indication to stop and then proceed with caution not to exceed a designated speed.

Stop, Emergency
The stopping of a train by an emergency brake application which, after initiated, cannot be released until the train has stopped.

Stop, Programmed
A train stop produced by closed-loop braking such that the train is stopped at a designated point according to a predetermined speed-distance profile.

Stop, Service (Full)
A train stop achieved by a brake application, other than emergency, that develops the (maximum) brake rate.

Stop Signal
A signal which displays the most restrictive aspect indicating stop.

Stop, Train Protection
A train stop initiated by the automatic train protection system.

Stopping Distance
The maximum distance on a portion of track, which any train, operating on such portion of track at its maximum authorized speed, will travel during a full-service application of the brakes, between the point where such application is initiated and the point where the train comes to a stop.

Stop Trip Arm
A device used to enforce compliance of a signal displaying a restrictive aspect. If a train operator fails to comply with the signal displaying a restrictive aspect, the stop arm contacts a trip device mounted on the from end of each train, causing the emergency brake application of the train braking system.

Stop Trip Arm Hook
A device used to hold the stop trip arm in the clear position.

Storage Tracks
Those tracks outside the yard upon where trains are stored. Properly identified sections of mainline tracks may also be designated and used as storage tracks.

Straight Dynamic Brake
Dynamic brake which functions entirely on its own, without any interface to any other retarding or braking system (e.g. friction brakes).

Street
See Highway

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Streetcar

- Streetcar is a type of light rail service where nearly the entire route is in streets or other roadways. Single-vehicle trains are most common with frequent in-street stops. They normally are used for shorter trips in central or higher density areas. Passenger stops are closer together than the station spacing on light rail systems.
- A form of urban rail transportation operating entire routes predominately on streets, often in mixed traffic. Typically operates single-car trains powered by an overhead contact systems and with frequent stops.

Streetcar Rail

This mode is for rail transit systems operating entire routes predominately on streets in mixed-traffic. This service typically operates with single-car trains powered by overhead catenaries and with frequent stops.

Sub-Ballast

A material, superior in composition to the roadbed material, that is spread on the track roadbed before the ballast is spread.

Sub-Drain

A covered drain below the roadbed or ground surface, receiving water along its length through perforations or joints, for the control and removal of excess water.

Subgrade

The finished roadbed surface upon that is laid the ballast and the track structure.

Substantial Completion

The point at which the elevator is ready for use, whether the site is finished or not. This is where the jurisdictional inspection usually takes place.

Subsystem

A defined portion of a system which is in turn composed of subsystems, component parts, or both.

Subway

- That portion of a transportation system that is constructed beneath the ground surface, regardless of its method of construction.
- An underground rail rapid transit system or the tunnel through which it runs.
- In local usage, sometimes used for the entire rail rapid transit system, even if it is not all beneath the ground surface.
- A pedestrian underpass.
- Underground Rail Alignment

Subway Tunnel/Tube

Rail transit way below surface with a cover over the tunnel. Cut and cover, bored tunnel, underwater tubes, etc., are included.

Super Elevation

- In track construction, the design vertical distance that the outer rail is set above the inner rail on a curve.

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- In highway construction, the banking of the roadway on a curve.

Superior Train
A train having precedence over another train.

Supervisor
One who oversees the activity of work or workers.

Supplier
- The entity which contractually acts as the source of a product.
- The supplier may or may not be the actual builder.

Surface Finish
The geometric irregularities that define the texture of a surface. All references to surface finish and the metrics and parameters quantifying the surface finish such as R_a, R_z, etc., are as defined in ASME B46.1.

Surveillance
A semi-formal activity initiated to allow staff a long-term overview of a process or activity. Requires formal reporting.

Switch
- The movable rails of a turnout that divert the wheels of passing rolling stock from one track to either ' one of two branching from it.
- To move rail cars from one place to another within a defined territory, such as an industry, a yard, or a terminal.
- A track structure of moving running rails (points) with necessary fastening to provide a means for routing trains from one track to another.
- A pair of switch points with their fastenings and operating rods providing the means for establishing a route from one track to another.

Switch and Lock Movement
A device, the operation of which performs the functions of unlocking, operating, and locking a switch, movable point frog, or derail.

Switch Block
A wedge-shaped wooden block designed to be forced between an open switch point and a stock rail of a track switch, to hold the other switch point firmly against its stock rail to ensure safe train passage.

Switch Cutout
A device that opens contacts and interrupts power to the switch motor.

Switch, Electro-Pneumatic
A track switch operated by an electro-pneumatic switch and lock movement.

Switch, Facing Points[109]
- A track switch, the points of which face toward approaching traffic.
- A switch operated by an electro-pneumatic switch-and-lock movement.

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Switch, Hand Operated[110]
A non-interlocked switch which can be operated only manually.

Switch Heater
- A device for melting or clearing snow or ice at rail switches by means of steam, electric, or oil heat or by air jets.
- A winter switch protection device consisting of either gas combustion burners or electric heating elements fastened directly to the stock rail or switch point in which the heaters raise the temperature of the steel to melt the snow and ice. Gas combustion burners may be of the direct flame impingement or radiant designs. Electric heating elements may be of the tubular, plate or pad designs.

Switch Indication Relay
A relay that indicates whether a switch machine is in or out of position.

Switch Indicator
An indicator used to indicate the position of switch points.

Switch, Interlocked[111]
A track switch within the interlocking limits, the control of which is interlocked with other functions of the interlocking.

Switch Latch
An assembly or device that latches the crank cutout contacts in the open position when engaged by a hand crank. When the switch latch is closed, the cutout contacts are restored.

Switch Layout
A complete track assembly that includes the switch machine, the switch points, rails, frogs, and other related components.

Switch Machine
A device that performs the mechanical function of controlling the movement of switch points or a derail from one position to the other.

Switch Obstruction Gauge
A thickness gauge (1/8”, 1/4”, 3/8”) used in switch points to test adjustments of switch locking and point detector.

Switch Point
A movable tapered track rail, the point of which is designed to fit against the stock rail.

Switch Point Clamp
A lockable device for clamping the base of a closed switch point to the base of the adjacent stock rail.

Switch Position, Normal
The position in which a switch is aligned for train movement continuing in the same direction.

Switch Position, Reverse
The opposite to normal position.

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The position of a track switch and its controls when opposite to the defining track layout.

Switch, Power Operated [112]
A switch operated by an electrically, hydraulically, or pneumatically driven switch-and-lock movement.

Switch Rod
A rod connecting the two points of a switch or moveable pint frog, by means of which the relative distance between the points is maintained.

Switch Rod Insulation
Non-conductive material used to electrically isolate the two sections of a switch rod.

Switch, Sectionalizing
A switch for disconnecting a section of power line from the source of energy.

Switch-Splitting
A type of derailment in which the vehicle's trucks follow different paths at a switch. Often damages the vehicle by subjecting the trucks to excessive rotation and may also cause them to derail.

Switch, Spring[113]
A switch equipped with a spring device which forces the points to their original position after being trailed through and holds them under spring compression.

Switch Throw Bar
The mechanical part in a switch machine which is driven by the main gear and which is connected to the switch throw rod.

Switch Throw Rod
The connecting rod that transfers motive force from the switch machine throw bar to the switch points.

Switch, Track
A pair of switch points with their fastening and operation rods providing the means for establishing a route from one track to another.

Switch, trailing points[114]
A switch, points of which face away from traffic approaching in the direction for which the track is signaled.

Switched Resistance
A propulsion system that utilizes a camshaft or logic network to control the operation of a series of electrical contacts and/or contractors, which shunt out resistors to regulate current to DC traction motors and thereby to accelerate the care and provide dynamic braking, if so equipped. Control of the cam may be through analog electronics or a microprocessor.

Symbol
- A letter, figure or other character or mark or combination thereof used for or regarded as designating something else.
- A letter, figure, other character, arrow or mark, or any combination thereof, used for designating something else by association, resemblance, or convention.

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System
A composite of those hardware, people or software subsystems, or any combination, which are integrated to perform a specific operational function or functions.

System, Automatic Block System (ABS)
A series of consecutive blocks governed by block signals, cab signals, or both, actuated by train movement or by certain conditions affecting the use of a block.

System, Automatic Cab Signal
An automatic block signal system in which cab signals are provided.

System, automatic train control
- A system which enforces speed restrictions and prevent exceeding speed restrictions by automatic brake applications; may additionally encompass automatic train operation, automatic train protection and automatic train supervision.
- A system so arranged that its operation will automatically result in the following:[115]
    a. A full-service application of the brakes which will continue either until the train is brought to a stop, or, under control of the engineman, its speed is reduced to a predetermined rate
    b. When operating under a speed restriction, an application of the brakes when the speed of the train exceeds the predetermined rate and which will continue until the speed is reduced to that rate.

System, Automatic Train Stop[116]
A system in which the train is brought to a stop through automatic brake application if imposed restrictions are ignored.

System, Block Signal[117]
A method of governing the movement of trains into or within one or more blocks by block signals and/or cab signals.

System-by-System Functional Orientation
A means of organization in which all items should be listed in the system where they function. If an item has dual functionality, it should be listed where it has primary functionality. Conflicts as to function will be resolved by the railroad.

System Control and Data Acquisition (SCADA)
A system to connect various equipment in a geographic area.

System Hazard Analysis (SHA)
An analysis performed on a system to identify, classify, and eliminate hazards. It identifies safety problem areas of an entire system and assesses total system risk by examining the interfaces of the subsystems.

System, Manual Block Signal
A block signal system operated manually, usually based on information communicated by telegraph or telephone.

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System Safety

- The application of management, engineering principles and techniques to achieve the optimum degree of safety within the constraints of operational effectiveness, time and cost, throughout all phases of the transit system life cycles, by identifying hazards and reducing associated risks.
- The application of Operating, Technical, and Management techniques and principles to the safety aspects of a system throughout its life to reduce hazards to the lowest level possible through the most effective use of available resources.

System Safety Analysis

The composite term used to describe the process of providing identification, evaluation and communication of those factors and in interactions within a given system (or element thereof) which could (1) cause, (2) contribute to and (3) are needed to control inadvertent injury, death or material loss during any or all phases and activities associated with the given system's life cycle, in a logical and systematic manner.

System Safety Engineering

The application of scientific and engineering principles during the design, development, manufacture and operation of a system to meet or exceed established safety goals, by identifying and resolving hazards.

System Safety Management

- An element of management that defines the system safety program requirements and ensures the planning, implementation and accomplishment of system safety tasks and activities consistent with the overall program requirements.
- The organized planning, controlling, and integration of all efforts directed towards System Safety.

System Safety Program

The combined tasks and activities of system safety management and system safety engineering that enhance operational effectiveness by satisfying the system safety requirements in a timely, cost-effective manner throughout all phases of a system life-cycle.

System Safety Program Plan (SSPP)

A document developed and adopted by the rail transit agency, describing its safety policies, objectives, responsibilities and procedures.

T

Tag Axle

A non-powered vehicle axle that helps distribute the load.

Tamp

The process of compacting ballast under ties.

Tape Size

The number of eights of an inch by which the circumference of the wheel, at the taping line, exceeds 84 in. Tape sizes are applicable only to wheels.

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Taping Line
The diameter of the wheel at the wheel tread taken from a measurement of wheel circumference using a tape positioned on the wheel tread at the center of the contact area between wheel tread and top of rail with the wheel set centered between the rails.

Tangent
- Straight portion of railway alignment.
- Straight, without curvature.

Team Leader
Individual in charge of an inspection team responsible for planning, preparing and performing field inspection of the fixed structure.

Temporary Warning Device
Signs, flags, lights, discs or targets installed when wayside workers are present to alert and direct the actions of train operators of approaching trains and removed when no longer needed.

Temperature
A specific degree of hotness or coldness as indicated on a standard scale as measured with a dry bulb type thermometer, unless otherwise noted.

Temperature Stabilized
A component is temperature stabilized when its entire mass has reached the ambient temperature of the environment in which it resides.

Terminal
- The end station or stop on a transit line or route, regardless of whether special facilities exist for reversing the vehicle or handling passengers- also known as a terminus.
- An assemblage of facilities provided by a railroad at an intermediate location for the handling of passengers and the receiving, classifying, assembling, and dispatching of trains.

Terminal Block
A molded non-conductive block of material containing several electrical wiring terminals.

Terminal Board
A small panel made of non-conductive materials containing one or more electrical wiring terminals.

Terminal Buss Bar
A heavy strap or bar normally made of copper, used to carry heavy currents or to make a common connection between several points.

Terminal Post
A terminal designed to electrically connect two or more wires.

Terrorism
The intentional and unlawful use of force and violence against people or property to intimidate or coerce a government, the civilian population or any segment thereof, in furtherance of political or social objectives.

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Tertiary Impact

- Passengers who have undergone a secondary impact and have glanced off-of that object to impact another object in the car.
- Another impact with the interior subsequent to a secondary impact during a collision. For example, a passenger may experience a secondary impact with a seat back and then a tertiary impact with another object in the car.

Test Track

A length of track usually separated from a main line, or of sufficient length to safely operate a car or train through a performance cycle (start, accelerate, run at maximum speed, decelerate, stop). The track is equipped with all the system safety features and, in addition, with automatic train control, if the operation is automatic.

Third Rail

- A rail mounted on insulators alongside the running rail which provides traction power for train operation. A rail mounted on insulators alongside the running rail which provides traction power for train propulsion.
- An electrical conductor (also called contact rail) located alongside the track designed to carry energy for the propulsion and auxiliary systems of trains.

Third Rail Current Collection Equipment

A mechanical assembly, commonly mounted to a rail transit vehicle truck frame (usually four assemblies per car, electrically linked together). Its design provides a continuous pressure applied sliding shoe connection to the third rail for the purpose of transferring power from the third rail to the rail transit vehicle.

Third Rail Shoe

- A metallic sliding contact attached to the trucks of electric rail vehicles for the purpose of collecting current from the third-rail distribution system.
- A truck-mounted power pickup device which slides on top of, on the side of, or under the third rail.

Third Rail System

A rail mounted on insulators alongside the running rail which provides traction power for train operation.

Thread

The top surface of the head of a rail that contacts the wheels.

Throat

That portion of a yard that connects the storage areas to the mainline lead tracks, or, in an automatic system, to the transfer zone.

Through Routing

The practice of joining the ends of radial transit routes to travel through downtown instead of having each route turn back in the downtown and return to its Origin.

Throughput

- The volume of vehicles passing, or people transported past a point or series of points during a given period of time.
- Traffic.

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Throw
The distance through which the switch points art moved laterally, measured at the No. 1 switch rod.

Tie
The transverse member of the track structure to which the running rails are fastened, which is centered on the track and designed to cushion, distribute, and transmit the stresses of traffic from the rail to the ballast.

Tie Plate
A plate that is used to provide a bearing area for the rail base that distributes the rail vehicle load to the tie and prevents lateral movement of the rail.

Tie Strap
A steel bar used to maintain tie spacing and prevent movement.

Tier I
Operating speed at speed not exceeding 125 mph (200 k/h). (49 CFR Part 238).

Tier II
Operating at speeds exceeding 125 mph but not exceeding 160 mph. (49 CFR Part 238).

Tier III
Operating in a shared right-of-way at speeds not exceeding 125 mph and in an exclusive right-of-way without grade crossings at speeds exceeding 125 mph but not exceeding 220 mph. (49 CFR Part 238).

Tight/Kinky Rail
CWR (Continuous Welded Rail) which exhibits minute alignment irregularities which indicate that the rail is in a considerable amount of compression.

Time, Acknowledging
A predetermined time within which an automatic brake application may be forestalled with an acknowledging device in an automatic train stop system.

Time, Allowance
Time for which an operator is paid even though the hours have not been worked or have not been worked in operating a transit unit. Forms of allowance time are pad time, report time, turn-in time, and sometimes, travel time and intervening time.

Time, Dead
Time during which no positive action is taking place.

Time, Deadhead (not-in-service time)
time spent moving a revenue vehicle in non-revenue service.

Time, Delay
The time which elapses after a controlling signal changes until the controlled output begins to change.

Time, Down
The total time during which the equipment is not in acceptable operating condition. Down time starts with a failure event and ends at the completion of repair and functional checks/inspections.

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Time, Layover
Time built into a schedule between arrivals and departures, used for the recovery of delays and preparation for the return trip. The term may refer to transit units (also known as vehicle layover) or operators.

Time, Linked trip
In transportation planning, the time duration of a linked trip, that is, from the point of origin to the destination, including waiting and walking time at transfer points and trip ends.

Time Locking
Either mechanical or electrical locking that prevents an established route from being changed until expiration of a predetermined time interval. Time locking is initiated when a signal is set to stop by a means other than normal train operation. Time locking differs from approach locking, as time locking is not conditional, and is in effect regardless if the approach track circuit is occupied or not.

Time, Preparation and Storage
The time in minutes paid to an operator to prepare or store the transit unit when pulling out and in, that is, report time and turn-in time combined.

Time, Pull-In
- In transit operations, the time at which the transit unit returns to the yard or garage; see also TIME, Turn-in.
- In some transit operations, the deadhead time assigned to move a transit unit (vehicle or train) from its last scheduled stop to the storage area; also known as stem time.

Time, Pull-out
- In transit operations, the scheduled time at which the transit unit leaves the yard.
- In some transit operations, the deadhead time assigned to move a transit unit (vehicle or train) from the storage area to its first scheduled stop; also known as stick time.

Time, Reaction
The time used by equipment, operator, or both, that elapses between the moment an action is called for and when the desired result occurs.

Time, Release
A device used to prevent the operation of a unit until after the expiration of a predetermined time interval after the device has been actuated.

Time, Response
In demand-responsive operations, the time between a passenger's request for service and the passenger pickup.

Time, Report
- The time at which operators must report if they are to work an assignment.
- The time at the beginning of a run that operators use to prepare themselves for duty and their vehicles for service before leaving the yard or garage. This time, usually 5 or 10 minutes, may be paid or unpaid. It is also frequently known as preparation time, pull-out time, or (only if paid) report time allowance. See also TIME, Pull-out.

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- In some properties, the time spent by an operator waiting for an assignment or protecting service in event of absence of another operator; also known as shine time.

Time, Running
The actual time required for a transit unit (vehicle or train) to move from one point to another, excluding time for stops.

Time, Spread
total elapsed time from the beginning to the end of a day's assignment, including all breaks, time between runs, travel time, and deadheading.

Time, Turn-in
The time at the end of a run that allows the operators to clear their responsibilities and prepare their vehicles for storage. The time may be paid or unpaid and may or may not be included in platform time. It is also frequently known as clear time, pull-in time, or storage time.

Time, Up
The time during which equipment is either operating satisfactorily or is in an operable state and ready to be placed in operation. Up time is initiated by a completion of-repair and is terminated by a failure event.

Time, Unlinked Trip
In planning, the time duration of an unlinked trip, that is, one made on a single vehicle.

Timetable
- Usually refers to a printed schedule for the public.
- A listing of the times at which transit units (vehicles or trains) are due at specified time points; also known as a schedule.
- In railroad operations, the authority for the movement of regular trains subject to the rules. It contains classified schedules with special instructions for the movement of trains and locomotives.

Timing Device
A timing relay or mechanical timer whose contacts become open and/or closed upon completion of a definite (usually adjustable) time interval (up to several minutes) after the timing relay has been energized or mechanical timer set.

Timing Signal
A signal that controls train speed by requiring that a certain time elapse in an approach block.

Tire
The rim section of a multi piece wheel.

Tired Wheel
A multi-piece wheel that uses a steel tire connected (with or without resilient elements) to a wheel center. The wheel center may be steel, aluminum, or other material.

Toe
The end of a frog nearest the switch.

Toe Length

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The distance between the half-inch point of frog and the tow, measured along the gauge line.

Toe Load
The clamping load generated by an elastic rail clip on a rail base.

Toe Spread
The distance between gauge lines at the toe.

Tolerance
An allowable variation from dimensions or requirements specified.

Tone Generator
An inaudible cue, which alters radio relay stations to activate themselves to allow the transmission of a message.

Torque
- The twisting force required to turn a bolt or a rotating shaft.
- A force that produces rotational twisting.

Torque Stripe
Registration marks painted across a fastener and an adjacent stationary reference surface immediately after the specified tightening torque has been applied. Marks subsequently found out of registration indicate relative motion, probable loosening and reduced clamping forces.

Torque Wrench
A device that sets, limits, and measures the amount of rotational force.

Total Indicated Run Out (TIR)
Total deviation from perfectly round condition.

Total Trips
The total number of trips taken over a given period of time (usually weekly, monthly, quarterly, or annually).

Total "Vehicle-Caused" Late Trips
The total number of times that a train completes a late trip due to a vehicle failure over a given period of time (usually weekly, monthly, quarterly, or annually).

Towering Adapter
Device used to interface transit couplers to conventional knuckle couplers or to transit couplers of different coupling configuration. Used for towering and/or rescuing transit vehicles.

Track
- An assembly of rails, supporting ties, and fastenings over which rail vehicles travel.
- A linear cam or way that physically guides (and usually supports) any matching vehicle used for transportation.
- The width of a wheeled vehicle from wheel to wheel, usually measured between the outsides of the rims.

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- The distance between the centers of the tread of parallel wheels, as of an automobile.

Track Allocation
The management, scheduling, and authorization of access by employees and contractors to perform work on, near, or adjacent to the right of way or any RTA facilities.

Track, Ballasted
Track constructed of rail, ties and ballast.

Track Brake
- A friction brake, usually activated electromagnetically, which compresses against the running rails.
- A magnetic friction brake that compresses against the running rail and is activated by an electric signal.

Track Car
Any vehicle that operates on rail and that does not positively shunt track circuits.

Track Circuit
An electrical circuit that makes use of both rails to detect train occupancy of the track and, in response, to actuate signals, train control devices, and grade crossing protective equipment.

Track Controlled
Track upon which the RTA's operating rules require that all movement of trains must be authorized by a train dispatcher or a control operator.

Track, Direct Fixation (DF)
Track constructed of rail and direct fixation rail fasteners attached by means of anchor bolts to a concrete slab a plinth or a steel surface

Track Elements
The rails used to move either revenue or service rolling stock. Linear assets are reported as either Tangent, Curve, or Special Work Assets. Tangent and Curve track will be reported in terms of track miles. Special work assets will be reported as the quantity of each subcategory listed below:
- Double diamond crossover
- Single crossover
- Half ground union
- Single turnout
- Grade crossing

Track Indicator
A device used to indicate the occupancy of a given track section.

Track Instrument
A device in which the vertical movement of the rail or the blow of a passing wheel operates a contact to open or close an electric circuit.

Track Lateral Resistance
The resistance provided to the rail/crosstie structure against lateral displacement.

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Track Layout
An organized assemblage of track; the depiction thereof for control purposes.

Track Longitudinal Resistance
The resistance provided by the rail anchors/rail fasteners and the ballast section to the rail/crosstie structure against longitudinal displacement.

Track, main (Also referred to as Mainline track)[118]
A track other than auxiliary track, extending through yards and between stations, upon which trains are operated by timetable or train order, or both, or the use of which is governed by signals.

1. **Double-track main** - a rail main line that has two tracks, usually one for each direction.
2. **Single-track main** - a rail main line that has one track. It requires passing sidings for bi-directional operation.

Track Miles (Track Kilometers)
The sum of the one-way linear miles (kilometers) of all trackage in a system, including all main track and trackage in yards, car barns, switches, and turnouts.

Revenue (revenue track kilometers) - the number of miles (kilometers) of track used in passenger-carrying service.

Service (service track kilometers) - the number of miles (kilometers) of track used exclusively in non-revenue service

Track Mobile
A self-powered road-rail vehicle.

Track Relay
A relay receiving all or part of its operating energy through conductors of which the track rails are an essential part.

Track Reversible
A section of track on which the prescribed direction of running can be reversed if it is unoccupied and the opposing home signal is at "STOP".

Track Single
A main track on which trains are operated in both directions.

Track Switch
A pair of switch points which, with their fastenings and operating rods, provide the means for establishing a route from one track to another.

Track Transfer
A track in a yard area where the transfer between main track and manual yard modes of operation takes place.

Track Transformer
An electrical device used to supply ac voltage for a track circuit and/or secondary signal circuits.

Track Travel
The movement of OTE on track outside of working limits.

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Track Trip
A device that is located near the track and interconnected with the signal system so that it triggers the emergency brakes of any train that passes when the signal is red.

Track Twist
The rate of change of track cross-level.

Trackwork
The rails, switches, frogs, crossings, fastenings, pads, ties, and ballast or track-support slab over which rail cars are operated. Special (track special work) - all rails, track structures, and fittings, other than plain unguarded track, that is neither curved nor fabricated before laying.

> **Special** (track special work) - all rails, track structures, and fittings, other than plain unguarded track, that is neither curved nor fabricated before laying.

Track, Yard and Secondary
Track constructed for the purpose of switching, storing or maintaining rail vehicles and not used for carrying revenue passengers.

Track Hunting
Unstable dynamic motion comprising sustained oscillations in yaw and lateral displacement of the truck frame and wheelsets from flange to flange.

Traction Electrification System (TES)
The entire system used to transfer power from local power utility to the vehicle, comprised of the Traction Power System (TPS) and the Overhead Contact System (OCS) and/or Ground Level Power Supply (GLPS).

Traction Horsepower
The rating for a diesel power plant which is the manufacturer's guaranteed input to the main generator for traction purposes at standard conditions. Auxiliaries are operated at nominal loads as specified by the manufacturer, except (1) air compressor is uploaded and (2) no power is supplied for head end power or other train service.

Traction Power System (TPS)
Comprising the Traction Power Substations (TPSS) and the Traction Power Feeder System (TPFS) (i.e. duct banks and traction power feeder and return cables)

Traction Power Return Cable
Heavy duty cable of various sizes that are connected to the running rails, impedance bonds, and other track locations and components that provide a path for the negative traction power current to flow and be returned.

Tractive Effort (Tractive force)
The force exerted by a locomotive or other powered vehicle on its driving wheels. It is equal to the weight on the driving wheels times the coefficient of adhesion.

Traffic

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- In traffic engineering and transportation planning the vehicles, people, or both that pass a specified point during a given period.
- The prescribed direction of train operation in a section of track between interlockings or between consecutive signals. The direction of traffic for a section of track is locked and cannot be changed when a block in that section is occupied or a signal is cleared for a route into that section.

Diverted (diverted demand): A component of traffic that has changed from its previous path of travel to another route without a change in origin, destination, or mode of travel; for example, traffic diverted from a major street to a new expressway, roughly parallel to the street, because of savings in time or distance.

Induced (induced demand): The added component of traffic volume that did not previously exist in any form but that results when new or improved transportation facilities are provided, for example, trips to a shopping center by the transit dependent when transit service to the shopping center is started.

Traffic Control Device
A sign, signal, marking, or other device placed on or adjacent to a street or highway, by authority of a public body or official that has jurisdiction, to regulate, warn, or guide traffic.

Traffic Locking
Electric locking which prevents the manipulation of levers or other devices for changing the direction of traffic on a section of track in between interlockings while that section is occupied or while a signal displays an aspect to proceed into that section.

Traffic Rectifier
A device that converts alternating current to direct current for traffic circuits.

Trailing Point Switch
A track switch, the points of which face away from traffic approaching in the direction for which the track is signaled.

Train
- A rail vehicle that is used or intended to be used in revenue service**.**
- A rail revenue service vehicle such as any motorcar, locomotive, or other self-propelled on-rail vehicle, with or without other cars coupled.
- A consist of one or more cars combined into an operating unit.

Local: A train that stops at every station on the line; see also SERVICE, Local.

Push-pull: A locomotive and a set of cars equipped with one or more cab cars from which the locomotive can be controlled. The train is either pulled and controlled from the locomotive in the conventional manner or pushed by the locomotive and controlled from the leading car.

Train Approach Warning
A method of establishing on-track safety by warning roadway workers of approaching trains or on-track equipment.

Train Berth
In rail operations, the space designated for a train of given length to occupy when it is stopped at a station platform, in a terminal, on a transfer track, or at some other designated place.

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Train Control Receiver
A device on a vehicle so placed that it is in position to be influenced inductively or actuated by an automatic train control or cab signal roadway element.

Train Control Room
- A special room that houses signal relay systems and has equipment whereby one could control the signaling system.
- Sometimes also referred to a TC&C Room (Train Control & Communications Room).

Train Control & Communications Room
A special room that houses signal relay systems and has equipment whereby one could control the signaling system.

Train Control System
The system for controlling train movement, enforcing train safety and directing train operations.

Train Control Territory
The portion of a railroad division or district that is equipped with an automatic train control system.

Train Controller
- The person responsible for authorizing rail vehicle movement. Duties may also include, but are not limited to, train control, train dispatching, train supervision, and related field activities.
- An employee, usually stationed in a control center, authorized and responsible to direct the operation of trains on the mainline. Some rail systems may employ other employees, subordinate to the controller, to facilitate train movements at critical locations.

Train Coordination
A method of establishing working limits on track upon which a train holds exclusive authority to move whereby the crew of that train yields that authority to a roadway worker.

Train Crew
People authorized to carry out the duties of operating the train.

Train Crew Member
One or more railroad employees involved with the train movement of railroad rolling equipment and working together as an operating crew. This operating crew unit is under the charge and control of one crew member, generally the conductor of the train, and subject to the railroad operating rules and program of operational tests and inspections as well as governed by the Hours of Service Act.

Train Density
- The number of trains that can be operated safely over a segment of railroad in each direction during a 24-hr period.
- The average number of trains that pass over a specified section of railroad in a specified period (such as TPH meaning number of trains per hour).

Train Describer
- A document or display device that gives information about the origin, destination, class, or character of trains, locomotives, or rail cars that are moving or to be moved between given points.
- An instrument used to give information regarding the origin, destination, class or character of trains,

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engines or cars moving or to be moved between given points.

Train Detection
A method by which the presence of a train in a block is known.

Train Dispatcher
The railroad employee assigned to control and issue orders governing the movement of trains on a specific segment of railroad track in accordance with the operating rules of the railroad apply to that segment of track.

Train Hours
The hours that trains are scheduled to or actually travel while in revenue service (actual train revenue hours) plus deadhead hours.

Including:
- Layover/recover time

Excluding:
- Hours for charter service;
- Operator training; and
- Vehicle maintenance testing

Train Identification
A method of identifying trains using information such as train number, destination, length, or a combination of these elements. May be accomplished automatically for such functions as routing.

Train Induced Forces
The vertical, longitudinal, and lateral dynamic forces which are generated during train movement and which can contribute to the buckling potential.

Train Length
The number of units (cars) in a train; its overall length in dimensions of distance.

Train Line
- Circuit that runs the complete length of the train enabling the same control circuits in all cars to be active at the same time.
- An electrical cable system that allows electrical signals to be sent over the entire length of the train. Types include power, control, communication and data, often with more than one function contained within the same cable. The trainline may connect to equipment in each vehicle, or may simply pass through, providing a signal path between vehicles on opposite ends of that vehicle.
- Wires routed between cars by means of couplers or jumper cables so that power or signals may be transmitted to all cars of the train.
- A train line whose function is primarily to convey car control and communication signals throughout the train. Typically signals include: door controls and indications, public address, brake applied/released indications, etc.

Train Line Car Control/ Communication
A train line (referred to within this document as “communication”) whose function is primarily to convey

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car control and communication signals throughout the train. Typical signals include: door controls and indications, public address, brake applied/released indications, etc.

Trainline Complete (TLC)

- The train line complete circuit is a series continuity check, originating at the HEP control system, used to determine that all HEP train line jumper cables throughout the entire length of the consist are plugged correctly. The circuit provides an indication at the HEP control panel and is interlocked with the HEP main contractor/circuit breaker to allow the train lines to be energized only when the TLC circuit is established.

  CAUTION – The practice of shortlooping will negate the TLC protection and is generally prohibited except when absolutely necessary to protect the health and well-being of passengers.

- A series continuity check circuit used to determine that all trainline jumper cables throughout the consist are plugged in. The circuit provides an indication at the HEP control panel and is interlocked with the HEP main contactor/circuit breaker to allow trainlines to be energized only when the TLC is established.

Trainline Door Circuit[119]

A circuit used to convey door signals over the length of the train.

Trainline, Multiple Unit (MU)

- A train line whose primary function is to convey traction and dynamic brake commands and indications. This train line is used to provide those signals between:
  1. Locomotives coupled together
  2. Cab car and locomotives
  3. Locomotives or power cars placed at opposite ends of the train

- A system that controls the operation of two or more motor cars in a train through the simultaneous control of the train by one operator.

Train Line Interoperability

The ability of basic operating units that constitute a train to communicate successfully with each other through coupler interface(s), without limitation as to the sequence or orientation of the basic operating units within the train, and without requirement for manual configuration other than optional manual confirmation of basic operating unit sequence within the train.

Train Miles

The miles that trains are scheduled to or actually travel while in revenue service (actual train revenue miles) plus deadhead miles. Actual train miles exclude:

- Miles for charter service;
- Operator training; and
- Vehicle maintenance testing

Train Number

Numerical designation of a train.

Train of Superior Right

A train given precedence by train order.

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Train Operation
The way in which a train is operated, for example, automatic with automatic over-speed control, or manual with either automatic or manual speed control, or skip-stop.

Train Operator
- An authorized onboard employee who controls the movement of a train.
- A qualified employee having direct control and responsibility for the movement of a train.

Train, Opposing
A train, the movement of which is in a direction opposite to and toward another train on the same track.

Train Orders
Instructions, usually written, used to govern train operations manually.

Train Protection
That subsystem within the automatic train control system which maintains safe train operations through a combination of train detection, train separation, and interlocking.

Train Revenue Miles
The miles that trains are scheduled to or actually travel while in revenue service.

Excluding:
- Deadhead;
- Training operators prior to revenue service;
- Vehicle maintenance tests; and
- Charter services

Train Stop
A wayside device that controls the trip arm device located on the underside of a train.

Train Stop Circuit Controller
Device for opening and closing electrical circuits operated by a rod connected to a component within the stop mechanism.

Train to Wayside Communications (TWC)
General term used to describe a system of communication between the vehicle and wayside track and signal apparatus. In the streetcar mode, TWC is used primarily for traffic signal interface, and may also be used for route selection. Can be implemented with various technologies including optical and inductive systems. Non-vital transmission of data from a transit vehicle to wayside systems or from wayside systems to a transit vehicle, which may include train identification, length, door status, position reference information, approaching station information, speed, and acceleration modification, departure testing, and dispatching instructions.

Train Washer
An apparatus made up of brushes, spray arches, solution tanks, water reclamation system and controls to wash cars or trains passing through the apparatus. The washer is usually fully automatic and should be located in the best possible work flow position. It is generally placed in a protective building in cold climates.

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Trainline

- Circuits routed between cars by means of couplers or jumper cables so that power or control signals may be transmitted to other cars of the train.
- An electric cable system that allows electrical signals to be sent over the entire length the train. Types include power, control, communications and data, often with more than one function contained within the same cable. The trainline may connect to equipment in each vehicle, or may simply pass through, providing a signal path between vehicles on opposite ends of that vehicle.

Train Line Termination Plug

A device that may be used in place of an ECP EOT to allow train line power to remain ON continuously and to allow train movement in SWITCH mode only.

Trailing Movement

The movement of a train over the points of a switch which face in a direction in which the train is moving.

Tram-Train

Railcars or trains which run like trams (streetcars) in city streets, and on heavy rail tracks out to the suburbs or between the cities.

Transducer

An electrical or mechanical device that converts physical motion into electrical impulses that can be easily counted and processed by a computer. Examples of transducers include fuel flow meters, vehicle odometers, and passenger-counting infrared beams.

Transfer

- A passenger's change from one transit unit (vehicle or train) or mode to another transit unit or mode.
- A slip of paper, card, or other instrument issued to passengers (either free or with a transfer fee) that gives the right to change from one transit unit or mode to another according to certain rules that may limit the direction of travel or the time in which the change may be made.

Transfer Zone

A zone of one or more tracks or guideways used in an automatic train control operation. It is located between a yard and main line leads and is that area that separates a manual yard operation from an automatic main line operation.

Transit Asset Management Plan[120]

A plan developed by a recipient or Group Plan pursuant to 49 CFR Part 625 that include, at a minimum, capital asset inventories and condition assessments, decision support tools, and investment prioritization.

Transit Car, Rail Rapid

An electrically propelled passenger carrying rail vehicle characterized by high acceleration and braking rates for frequent stops, and fast loading and unloading.

Transit Center

A transit stop or station at the meeting point of several routes or lines or of different modes of transportation. It is located on or off the street and is designed to handle the movement of transit units (vehicles or trains) and the boarding, alighting, and transferring of passengers between routes or lines (in which case it is also known as a transfer center) or different modes (also known as a modal interchange center or an intermodal transfer facility).

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Transit Dependent
Having to rely on transit services instead of the private automobile to meet one's travel needs.

Transit District
A geographical or political division created specifically for the single purpose of providing transportation services. It is a separate legal entity and usually possesses the authority to impose a property tax. Such political divisions may also be known as a transit agency or transit authority; see also PROPERTY.

Transit System Availability
A measure of the capability of a transit system to be used by potential passengers, including such factors as the hours the system is in operation, route spacing, and accessibility to the physically handicapped.

Transit System Fail Safety
The integration of the design, procedures, people and all other elements of a transit system using the principles of fail safety and system safety in such a manner that equipment failures or personnel errors, or combinations of both, shall not result in an increased hazard level.

Transit Unit
One or more transit vehicle coupled and operated together. The term includes single vehicles and multi-car trains (rail or other guideway) bidirectional or double-ended; (See DOUBLE-ENDED TRANSIT UNIT.)

Transitway
A dedicated right-of-way, most commonly in a mall, that is used by transit units (vehicles or trains), usually mixed with pedestrian traffic.

Transmit Signal
Energy containing encoded information sent from wayside antennas to transit vehicle antennas.

Transmitter
A device that produces radio frequency signals.

Transmitter Carrier
The main frequency of a transmitter.

Transportation Department
That functional unit within an organization that generally has responsibility for operation of cars, trains and stations, including a Central Control facility.

Transportation Disadvantaged (low mobility group)
People whose range of transportation alternatives is limited, especially in the availability of relative easy-to-use and inexpensive alternatives for trip making. Examples include the young, the elderly, the poor, the handicapped, and those who do not have automobiles See also TRANSIT DEPENDENT; RIDER, Captive; and RIDER, Captive transit.

Transportation System
- A system that provides for the movement of people, goods, or both.

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- A coordinated system made up of one or several modes serving a common purpose, the movement of people, goods, or both.

  Air cushion: A surface transportation system that uses vehicles that are supported above the guideway by a thin layer (cushion) of air.

  High-speed ground (HSGT): A guided transportation system with exclusive right-of-way and vehicles intended to serve a densely traveled corridor at cruise speeds of 124 mph (200 km/h) and greater.

Transportation System Management (TSM)
That part of the urban transportation planning process undertaken to improve the efficiency of the existing transportation system. The intent is to make better use of the existing transportation system by using short-term, low-capital transportation improvements (LCTI) that generally cost less and can be implemented more quickly than system development actions.

Transportation System Management Alternative (Low capital alternative, no-build alternative, TSM alternative)
The planning option of not building a new transportation facility, such as a new highway or rail system, but instead improving the already existing transportation system, for example, by making streets one way or increasing public transportation services.

Transverse
- Descriptive of a direction perpendicular to the normal direction of car travel.
- Perpendicular to the centerline of the track in the horizontal plane.

Transverse Defect
For defects found by detector cars, a tentative group classification, applied prior to the breaking of the rails, of all types of rail defects which have transverse components, such as transverse tissues, compound fissures and detail fractures.

Transverse Fissure
A progressive crosswise fracture starting from a crystalline center or nucleus inside the head from which it spreads outward as a smooth, bright or dark, round or oval surface substantially at a right angle to the length of the rail. The distinguishing features of a transverse fissure from other types of fractures or defects are the crystalline center or nucleus and the nearly smooth surface of the development, which surrounds it.

Trap Door
A hinged panel that rotates upward to reveal a set of steps used for low level access. In the down position, the panel becomes part of the floor used for high level platform access. In both the up and down positions, the panel is retained by a latch and the panel usually contains a handrail on the underside for use when in the up position.

Tread
The top surface of the head of a rail, which contacts wheels.

Tread Brake Shoe
A replaceable friction element secured to a brake head for the purpose of producing a retarding force onto the tread of the wheel.

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Tread Brake Unit

- A unit composed of brake shoe and apparatus to apply the brake shoe to the wheel tread.
- A friction brake in which the brake shoes create retarding force by rubbing on the wheel treads.

Trip

- A one-way movement of a person or vehicle between two points for a specific purpose; sometimes called a one-way trip to distinguish it from a round trip.
- In rail operations, a mechanical lever or block signal that, when in the upright position, activates a train's emergency braking system.
- The movement of a transit unit (vehicle or train) in one direction from the beginning of a route to the end of it; also known as a run.
- Travel of a train from its departure station to its destination station.

Home-based: A trip that has either it origin or destination at the traveler's residence.

In-bound: A trip toward the central urban area, into the central business district, or to a timed transfer point or major activity center.

Linked (linked journey, linked passenger trip): A trip from the point of origin to the final destination, regardless of the number of modes or vehicles used.

Passenger: One passenger making a one-way trip from origin to destination.

Unlinked:

1. A trip made in a single vehicle.
2. The boarding of one transit vehicle in revenue service; also known as an unlinked passenger trip.
3. Any segment of a linked trip.

Trip Assignment

In planning, a process by which trips, described by mode, purpose, origin, destination, and time of day, are allocated among the paths or routes in a network by one of a number of models; see also URBAN TRANSPORTATION MODELING SYSTEM and MODEL, SEQUENTIAL.

Stochastic - a probabilistic trip assignment technique that allocates trips with deviation from the minimum time route on the basis of differences in travel time.

Diversion - a trip assignment technique that allocates trips to alternate routes on the basis of the relative times or distances (or both) involved.

Trip Cock

A mechanical device located on the train which, when hit by a trip stop located on the track, results in an emergency brake application.

Trip Distance

Linked (total travel distance) - the distance traveled on a linked trip, that is, the distance from the point of origin to the final destination, including the walking distance at trip ends and at transfer points.

Unlinked - the distance traveled on an unlinked trip, for example, a trip on a single vehicle.

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Trip End
A trip origin or a trip destination.

Trip Generation
In planning, the determination or prediction of the number of trips produced by and attracted to each zone; see also URBAN TRANSPORTATION MODELING SYSTEM and MODEL, Sequential.

Trip Generator
A land use from which trips are produced, such as a dwelling unit, a store, a factory, or an office.

Trip Length Frequency Distribution
A list or diagram of the number or the percentage of trips made at various intervals of trip time or distance.

Trip Matrix
In planning, an array of the number of trips made between each zone pair; see also TRIP TABLE.

Trip Stop (Arm)
A mechanical arm located on the wayside which, when in the up (trip) position, initiates an emergency brake application on a train which passes it.

Trip Stop, Fixed
A trip stop permanently positioned in the tripping position.

Trip Table
A table that presents the number of trips between zones, classified by mode, purpose, time period, type of vehicle, or other category; see also TRIP MATRIX.

Tripper
- In transit operations, a short piece of work that cannot be incorporated into a full day's run, usually scheduled during peak hours.
- In transit operations, a short work schedule for operators, usually 1-3 hr. long; for example, during peak periods.
- On some transit properties, a short run that is less than 8 hr. long.
- On some transit properties, a transit service that operates on only a portion of a route, usually at peak hours.

Trolley
- An apparatus, such as a grooved wheel or shoe, at the end of a pole, used for collecting electric current from an overhead wire and transmitting it to a motor of a street- car, trolleybus, or similar vehicle, where it is used for traction and other purposes.
- Sometimes used locally as another term for a streetcar.

Trolley Pole
A swiveling spring-loaded pole attached on the roof of a streetcar that holds a wheel or sliding shoe in contact with the overhead conductor (which usually takes the form of a thick wire), collects current from it, and transmits the current to the motor on the vehicle.

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Trolley Wire
An overhead wire from which a transit vehicle collects propulsion and auxiliary power.

Truck
- Rail vehicle component that consists of a frame, wheels, axles (where used), brakes, suspension, and other parts, which supports the vehicle body. Powered trucks also contain traction motors and related drive elements.
- A major transit vehicle assembly of structural members, wheels and axles, motors, gearboxes, brakes, collectors, cable, piping, etc.

Truck, Fixed
- As distinguished from a rotating truck. Fixed trucks are however capable of some limited degree of rotation relative to the car body (typically not more than 3°, although some newer designs now have rotation up to 4.5°. In comparison, a conventional double truck vehicle on a 35-foot (10.7 m) curve would have approximately 18° of truck rotation.
- As distinguished from a fixed truck. A truck capable of only a limited degree of rotation relative to the car body (typically less than 2 degrees in most designs, but up to 5 degrees in some cases). (In comparison, a conventional double-truck vehicle with 25ft [7.62 m] truck centers on a 35 ft [10.7 m] curve would have approximately 21 degrees of truck rotation).

Truck Hoist
Apparatus, either electro-mechanical or hydraulic, generally used in conjunction with boy joists, for raising transit vehicles for inspection and maintenance. Installation is part of ship track system.

Truck Hunting
- In rail operations, lateral instability of a truck, generally occurring at high speed and characterized by the shifting of one or both wheel sets from side to side so that the flanges strike the rail. The resulting motion of the rail car causes excessive wear in car and truck components and creates potentially unsafe operating conditions.
- Unstable dynamic motion comprising sustained oscillations in yaw and lateral displacement of the truck frame and wheelsets from flange to flange.

Truck Lift
Similar to garage auto lifts, usually hydraulic. Used to position separate car trucks at various elevations for maintenance.

Truck, Rotating
As distinguished from a fixed truck. Rotating trucks are designed to rotate under the vehicle on curves.

Trunk Line
A system that connects the private branch exchange (PBX) to the local carrier switch or public switch telephone network (PSTN).

Truck Warp
Warp measured relative to one of the four wheels of a two-axle truck with respect to the plane generated by the wheel-rail contact patches of the other three wheels.

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Truck Wheelbase
The longitudinal distance between the two axle centers on a two-axle truck.

Tuning Unit
- A device used to couple audio frequency transmission to the track.
- The portion of a two-piece signal impedance bond system that houses the electronic components that are wired in parallel with the bond toroid coils and used to form the resonant circuits required to provide specific ATP functions.

Tunnel
- An enclosed passageway, as for trains, automobiles, and so on, through or under an obstruction, such as a city, mountain, river, or harbor.
- An underground passage.
- An underground passageway for automobiles, trains, pedestrians, etc., completely enclosed except for openings for entrance and exit, commonly at each end.

Turn Back
- In transit operations, to cut short a transit trip (to turn back before reaching the end of the route or line), usually to get back on schedule or to meet peak passenger demands; also known as a short turn.
- In rail operations, a point along a track at which a train may reverse direction.

Turnout
An arrangement of a switch and frog with closure rails by means of which trains may be diverted from one track to another.

Turn Table
A device built into the track systems for turning separated or disconnected trucks in a shop for removal from or installation on a transit vehicle; or, a larger version for turning complete transit cars in a yard. The devices may be electro-mechanical or air cushion.

Turning
The removal of material from a part using a cutting tool in a lathe. The removal of material takes place with a stationary cutting tool in contact with the rotating part.

Turnout Number
The number corresponding to the number of the frog used in the turnout.

Turnover Point
A point along a transit route at which a large proportion of passengers leave and board a transit unit.

Turnstile, Fare
Registering-see fare-registering turnstile.

Two or More Tracks
Two or more main tracks upon which trains are operated as designated by the rules and special instructions.

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U

Ultimate Capacity
Maximum peak force resisted by the structural member.

Unacceptable Fire Safety Risk
A combination of fire hazard severity and fire scenario probability for a given category of equipment and service determined to be outside the "no-corrective-action-required" region of the fire safety risk index matrix.

Unauthorized Use
The usage of electronic devices not directly related to the specific job duties of an individual(s) or the use of job-related electronic devices in a way that would create an unsafe condition.

Unbonded Fastener
A resilient fastener where the elastomeric material is not bonded to a steel top plate or a steel bottom plate.

Uncoupling Device
Mechanism used to uncouple cars without requiring an employee to go between cars.

Underfloor or Rood-Mounted, Exposed Environment
Includes power resistors, open disconnect devices mounted outside protective enclosures.

Unified Command
A chain of command that is multi-jurisdictional in which more than one agency (including the RTA) shares responsibility for the management of the emergency.

Unit
The smallest consist which can operate.

Un-Interruptible Power Supply (UPS)
A system that provides continuous electrical power and acts as a backup power supply in the event of utility power loss.

Unlinked
- A trip made in a single vehicle.
- The boarding of one transit vehicle in revenue service; also known as an unlinked passenger trip.
- Any segment of a linked trip.

Unlinked Passenger Trips
Also called boardings, is the number of times passengers board public transportation vehicles. Passengers are counted each time they board vehicles no matter how many vehicles they use to travel from their origin to their destination, and regardless of whether they pay a fare, use a pass or transfer, ride for free, or pay in some other way.

Unsafe

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Having unacceptable risk in the occurrence of a hazard

Unsafe Condition
Any condition which endangers life or property.

Unscheduled Maintenance
Maintenance action initiated by the malfunction of equipment.

Unseen but Anticipated Damage
Hidden damage that is expected based upon the assessment inspection of the damage vehicle.

Up Time
The time during which an equipment is either operating satisfactorily or is in an operable state and ready to be placed in operation. Up time is initiated by a completion of repair and is terminated by a failure event.

Up Time Ratio (Steady State Availability)
The ratio of system up time to the total time. It is also expressed in terms of means as: MTBF/MTBF + MTTR.

Urban Transportation Modeling System (UTMS, Four-Stage Model, Four-Step Planning Process)
A system of models used in transportation planning as an approach to urban travel demand modeling. It consists of four major stages: trip generation; trip distribution; modal split; and trip assignment. UTMS predicts the number of trips by type, time of day, zonal original and destination, mode, and routes.

Useable Exit Path Value (UXP)
- After an incident that requires emergency egress from the vehicle, the number of emergency windows and exit doors that can be used by passengers. This value shall be the sum of EEUs for one side of the car less 50% of car end doors.
- The number of emergency windows and exit doors that can be used by passengers after an incident that requires emergency egress from the vehicle. This value shall be the sum of EEUs for one side of the car less 50% of car end doors.

Useable Length
As applied to sill steps, side door steps, and step treads, is the straight length, not including bend radii, above which the specified minimum clear depth exists. Unless otherwise stated, limitations on the length of sill steps and step treads apply to the useable length.

Useful Field of View (UFOV)
The sensory, perceptual and attentional processes that address the ability to attend to one's surroundings, detect information and identify that which demands action. In terms of behavior, UFOV includes that information which can be extracted from a glance.

V

Valve, Brake
A separate operator's control for the purpose of applying and releasing pneumatic friction brakes.

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Vane Relay
A type of alternating current relay in which a metal disc (vane) moves in response to current in the controlling unit.

Variable Load
Local adjustment of brake cylinder pressure based on the current passenger weight of the vehicle.

Vehicle
- An electrically propelled passenger carrying rail vehicle, or a diesel-powered passenger carrying rail vehicle.
- A land conveyance assembly for carrying or transporting people and objects capable of traversing a guideway, having structural integrity and general mechanical completeness, but not necessarily designed for independent operation.

Air cushion (ACV, ground effect machine): Any vehicle supported by a cushion of air.

Revenue: A vehicle used to provide passenger transit service for which remuneration is normally required. It is distinct from non-revenue equipment, which is used to build or maintain facilities, provide supervision, and so on.

Tracked air cushion (TACV): A laterally guided vehicle that is suspended above the track by an air cushion system.

Tracked levitated (TLV): A laterally guided vehicle that is suspended above the track by magnetic levitation.

Vehicles Available for Maximum Service
Vehicles that a transit agency has available to operate revenue service regardless of the legal relationship thorough which they are owned, leased, or otherwise controlled by the transit agency. Also called revenue vehicles owned or leased.

Vehicle Cab Voice Recording System (VCVRS)
An installed system, consisting of an audio recording mechanism, recording medium, and any sensors and wires that feed audio to the recording mechanism.

"Vehicle-Caused" Late Trip
A trip in which the train arrives at its destination station more than 5 minutes past its scheduled arrival time due to a vehicle failure on that train. Subsequent late runs with no vehicle failures made late by a dead train are not counted as vehicle-caused late trips.

Vehicle Data Recording System (VDRS)
An installed system, or a capability integrated into another functional system, consisting of a data recording mechanism, or recording medium, processing software and hardware, and any sensors and wires that feed vehicle performance data to the recording mechanism.

Vehicle Failure
The malfunction of any vehicle system, subsystem, or component.

Vehicle Hours (Miles)
The hours (miles) that a vehicle is scheduled to or actually travels from the time it pulls out from its garage to go into revenue service to the time it pulls in from revenue service. It is often called platform time.

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Vehicle Maintenance
All activities associated with revenue and non-revenue (service) vehicle maintenance.

Including:
- Administration
- Inspection and maintenance; and
- Servicing (cleaning, fueling, etc.) vehicles
- In addition, vehicle maintenance includes repairs due to vandalism and accident repairs of revenue vehicles.

Vehicle Revenue Hours (VRH)
The hours that vehicles are scheduled to or actually travel while in revenue service.

Including:
- Layover/recovery time

Excluding:
- Deadhead;
- Operator training;
- Vehicle maintenance testing; and
- School bus and charter services

Vehicle Revenue Miles (VRM)
The miles that vehicles are scheduled to or actually travel wile in revenue service.

Including:
- Layover/recovery time

Excluding:
- Deadhead;
- Operator training;
- Vehicle maintenance testing; and
- School bus and charter services

Vehicle Safety Certification
The vehicle component of the overall system safety certification program. The objective of the safety certification program is to produce a formal document that ensures that, at the time of operation, the system and all its components is safe for passengers, employees, emergency responders, and the general public. Safety certification is the process of verifying that certifiable elements comply with a formal list of safety requirements. The requirements are defined by design criteria, contract specifications, applicable codes, and industry safe standards.

Vehicle Signal-Actuating Device
A device to control traffic signals that is activated by vehicles.

Vehicle Total Hours
The hours a vehicle travels from the time it pulls out from its garage to go into revenue service to the time it pulls in from revenue service, including "deadhead" miles without passengers to the starting points of

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routes or returning to the garage. For conventional scheduled services, it includes both revenue time and deadhead time.

Vehicle Total Miles

All the miles a vehicle travels from the time it pulls out from its garage to go into revenue service to the time it pulls in from revenue service, including "deadhead" miles without passengers to the starting points of routes or returning to the garage. For conventional scheduled services, it includes both revenue miles and deadhead miles.

Vehicle Video Recording System (VVRS)

An installed system, consisting of a video recording mechanism, recording medium, and any sensors and wires that feed video to the recording mechanism.

Velocity

The distance passed per unit of time, or the rate of change in location relative to time. For transportation vehicles, it is usually measured in miles (kilometers) per hour.

Cruise (cruise speed): The forward velocity that a vehicle maintains when it is nether accelerating nor decelerating. It is usually less than maximum design speed but can be equal to it.

Effective (average speed): The average velocity at which a vehicle travels. For transit vehicles, it includes dwell times at stops or stations, acceleration, and deceleration.

Maximum theoretical: The highest theoretical velocity that a vehicle is physically capable of achieving.

Vented Lead Acid Battery

- A non-sealed storage battery consisting of electrode immersed in an electrolyte of dilute sulfuric acid. The electrodes contain lead oxides that change their composition as the cell is charged or discharged.
- A non-sealed storage battery consisting of electrodes.

Vented Standby Battery

A storage battery system vented to outside or circulating air that is held in reserve to serve as a backup power source in the event the regular power source fails.

Ventilation

The act or process of circulating air for the purpose of exhausting undesired heat, fumes, and/or gases.

Verification

A conformation of the accuracy, or correctness in comparison with a standard. As applied in safety certification, a safety verification is usually performed by an agent of the Authority and confirms an item or activity to an identified standard; a safety certification is an attesting by the Authority that the system is safe for patron use. Safety verification provides the audit trail of documented proof leading to a credible certification.

Vertical Split Head

A split along or near the middle of the head of a rail and extending into or through it. A crack or rush streak may show under the head close to the web, or pieces may be split off the side of the head.

Vertical Stiffness

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The stiffness of an elastomeric fastener from loads and deflections measured in the rail's vertical axis. If not stated explicitly otherwise, this stiffness value is measured with no rail cant.

Vestibule

- The enclosed area of a car adjacent to the side loading doors. It provides access to the car interior and generally (but not always) to the adjacent car.
- An area of a passenger car that normally does not contain seating and is uses in passing from the seating area to the side exit doors.

Vintage Trolley/ Streetcar (VT)

Vehicle type: Vintage or antique rail cars originally manufactured before 1975. The vehicles are typically operated in mixed traffic right-of-way (ROW), but may also operate on exclusive or controlled access rights-of-way (ROW).

Vital Circuit

Any circuit which affects the safety of train operations.

Vital Component or Circuit

Any device, circuit or software module used to implement a vital function.

Vital Function

- A system, subsystem, equipment, or component that provides a function critical to safety.
- A function in a safety-critical system that is required to be implemented in a fail-safe manner.

Vital Relay

A relay, meeting certain stringent specifications, so designed that the probability of its failing to return to the prescribed state upon de-energization is so low as to be considered practically nonexistent.

Vital System

Any system, the function of which affects the safety of train operations.

Voice/Data Carrier Transmission System

A multi-channel communication device used for the transmission and reception of voice and data.

Voltage

- High - in rail transportation, the prime propulsion power voltage supplied by an overhead wire or third rail, usually 500 - 1,500 V direct current.
- Low - in rail transportation, the voltage used for most auxiliary systems (e.g. Illumination, fans, public address systems), usually 24 or 72 V direct current or 110-240 V alternating current.

Voltage, Nominal

The terminal voltage of a fully charged cell or battery.

W

Walkover Seat

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A particular type of seat design in which the seat back and bottom cushion are articulated such that the direction that occupants face can be reversed by moving the seat back longitudinally.

Warning Devices
Sensors that monitor or detect conditions and provide visible and/or audible alerting signals as desired for selected events.

Warning Message
A visual or audible message produced by a system to warn maintainers or monitors of the status of a device, circuit, or system.

Warp
The maximum difference in cross-level measured at a specified chord distance, such as 62 ft, taken along a segment of track.

Watchman/Lookout
- An employee who has been annually trained and qualified to provide warning to roadway workers of approaching trains or on-track equipment. They shall be properly equipped to provide visual and auditory warning such as whistle, air horn, white disk, red flag, lantern, fuse. A watchman/lookout's sole duty is to look out for approaching trains/on-track equipment and provide at least fifteen seconds advanced warning to employees before arrival of trains/on-track equipment.
- A person who is qualified to provide warning to roadway workers of approaching trains and on-track equipment. A watchperson sole duty is to look out for approaching trains and on-track equipment and provide at least 15 seconds advanced warning to employees before arrival of the trains and on-track equipment.
- Field personnel assigned to alert workers engaged in activities on or near the right-of-way of train or on-track equipment movements.

Water Pocket
A depression in the roadbed, filled with ballast or other porous materials, wherein water collects, to the detriment of track stability. (Also described as "Ballast Pocket.")

Water Table
The underground water levels.

Wayside
A command and control system in which transit units (cars or trains) are controlled by electronic or mechanical devices along the track or other guideway.

Wayside Equipment
Train control or movement apparatus which is located along the track or wayside as opposed to the control center or other remote location.

Wayside Power
An installation which provides HEP from a ground-based source, used to provide power to the consist when the on-board source is unavailable, such as in a yard. Generally, utility power is sued, though sometimes a diesel generator is provided.

Wayside Signal

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A signal of fixed location along the track right-of-way.

Wayside Signal AC Power System
The system that provides AC power to rail transit signal systems typically including input transformer, inverters, converters, transfer, switches, UPS systems, fault protection equipment, breakers, and fuses.

Wayside Signal DC Power System
The system that provides DC power to rail transit signal systems typically DC power supplies, DC-to-DC converters and charging equipment

Wayside Signal Equipment
Components of the signal system located on the right-of-way.

Wayside Signal Mode, Regulated Speed
Operation in the wayside signal mode with the use of a speed regulator manually set by the operator.

Wayside Train Stop
A mechanical arm located on the wayside which, when in the up (trip) position, initiates an emergency brake application on a train which passes it.

Welding
Welding shall be performed in accordance with the requirements of AWS or CWB. Welders shall produce evidence of current certification by AWS or CWB.

Wet Cell Battery
A primary cell having a liquid electrolyte.

Wheel
May be all steel flanged, aluminum center with steel tire, with or without resilient material, or rubber tired, with or without steel guide wheels.

Wheel Chock
A removeable device that is manually applied to the railhead on either side of one wheel to deter standing a standing railcar wheel from rolling.

Wheel Grinding Machine
A machine built into a shop track system for removing flat spots or metal build-up from wheel trads. May use grinding stones or belts. Very useful for relatively minor wheel work. Should be equipped with dust collection equipment.

Wheel Load (WL)
Vertical load of the wheel on the rail.

Wheel Press
A machine used to press wheels, discs, or gearboxes on and off axles. Machine is generally equipped with a permanent recording device. Usually located near truck repair area.

Wheel Profile Gauges

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Instruments for determining the deviation of the observed, actual wheel profile from the new or ideal wheel profile.

Wheel Profilometer
Any device that accurately measures wheel flange and tread profile contour. Such a measurement device shall measure with sufficient precision to enable computation of effective wheel tread taper.

Wheel Set
The term used to describe a pair of wheels mounted on an axle.

Wheel Set Assembly
A collection of components fully assembled into a single unit that allows rolling movement of the rail vehicle to which it is attached.

Wheel Spinning Jacks
Mechanical or hydraulic devices, built-in or portable, used for raising a wheel set or sets clear of running rail so wheels may be rotated under power.

Wheel Tread Taper/Conicity
The slope of the wheel tread or running surface relative to the axis of the wheelset. Wheel tread taper may vary with respect to the lateral location of the point of rolling contact as the wheelset is shifted laterally from its centered position between the rails. Tread taper is generally expressed as a ratio of the unit rise per lateral distance; for example, 1:20 (a rise of 1 in 20). Conicity is typically expressed as a decimal value; for example, 0.05. Both taper and conicity represent the same quantities.

Wheel Truing Machine
A machine for returning steel wheel profile to original contour; built into ship track system; may be tracer lathe type or milling machine type. Should be equipped with chi collection and removal equipment.

Wheel Unloading
A vehicle condition in which one or more wheels bears less than its normal, static vertical load (nominal wheel load or NWL) because of anomalies in the suspension and/or track geometric features such as excessive twist. Problems arise when the vertical load decreases, but the lateral load does not, as in curving as the L/V ratio can rise to unsafe levels and increase the danger of derailment. APTA Standard SS-M-014-06 describes wheel unloading (WUL) as “Wheel load difference as a percentage of NWL; [WUL = {(NWL-WL)/NWL} x 100]”, with WL being the actual vertical load on the wheel of interest.

Wheel load difference as a percentage of NWL: WUL = {(NWL-WL)/NWL}x100

Width
The distance between the gage line and the guard line of a track structure, which provides a passageway for wheel flanges.

Wiggle Wire
An antenna used for wayside-to train communication.

Windscreen
A panel located adjacent to side doorways which provide security, and protection for the passengers from the elements.

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Wire
All insulated single-conductors, regardless of size.

Wireway
A rigid rectangular raceway provided with a cover.

Work Car
Generally, specially-built special-purpose freight type cars such as ballast cars, flat cars, rail car, wheel cars, grinding cars.

Work Flow
The system of plans and procedures to develop the logical sequence of work tasks required.

Work Train
A train composed of work cars pulled by a prime mover, generally a locomotive.

Work Zone
- A segment of track with definite boundaries upon which trains and/or on-track equipment may move only as authorized by the roadway worker having control over that defined segment of track.
- A section of track where train operations are temporarily restricted due to the presence of one or more roadway workers; may be designated by use of a temporary warning device.

Working Limits
- A specified section of track within a work zone where workers are engaged in work.
- A segment of track with definite boundaries upon which trains and/or on-track equipment may move only as authorized by the roadway worker having control over that defined segment of track.

Working Point
Points of intersection of step nosing line and horizontal line of the top and bottom landing plates at finish elevation.

Working Radio
A radio that can communicate 2-ways (transmit and receive), with the Operations Control Center of the railroad (through repeater stations, if necessary) from any location within the rail system, with the exception of limited segments of territory where topography or transient weather conditions temporarily prevent effective communication.

Working Wireless Communications
A hard-wired radio, portable radio, cellular telephone, or other means of two-way communication, with the capability to communicate with either the OCC or an emergency responder of the railroad from any location within the rail system (with the exception of limited segments of territory where topography or transient weather conditions temporarily prevent effective communication).

Workstation Table
A fixed interior table that is installed in a passenger rail coach car, consisting of a flat tabletop and its supporting structure that is often installed between facing seats.

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Worst Case Analysis
Analysis of the worst-case parameters of a system or subsystem.

Wye (y)
A track or guideway arrangement allowing a car or train to be turned by a series of moves; requires much yard space.

Y

Yard[121]
- A facility within defined limits that has a system of tracks used for making up trains, storing trains and other purposes. A maintenance facility may be included.
- A system of tracks within defined limits for making up trains and storing cars over which movements not authorized by time table or by train order may be made, subject to prescribed signals and rules, or special instruction.
- A system of tracks within defined limits for making up trains and storing cars, or other purposes.

Yard Control Tower
An airport-like structure overlooking as much of a yard and mainline as possible and housing the personnel and equipment required to control movement of trains and work vehicles throughout the yard, transfer zones, and lead tracks.

Yard Intercom System
A system for communicating audio information to employees within designated yard zones/groups

Yard Limits
A portion of a single main track between yard limit boards, as specified by special instructions.

Yard Master
- The employee who supervises the movement of trains within a yard.
- A Transportation Department employee generally the supervisor of a yard's transportation activity.

Yard Speed
A speed, used within yard limits, that will permit stopping within one-half the range of vision.

Yard Storage
A system of tracks within defined limits for making up trains and storing transit cars.

Yard Supervisor
One who oversees the activity of work or workers in the yard.

Yard Tracks
All tracks other than mainline tracks, such as yard tracks, storage tracks or tracks designated as such in a rulebook or standard operating procedure.

Yoke
A mechanical articulation connection as part of a coupler assembly that allows for normal limited movement in the vertical plane, horizontal plane, and rotation about the longitudinal axis to compensate for

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the natural varied orientation of coupled rail transit vehicles in motion.

Z

Zero Longitudinal Restraint (ZLR) Systems

A special category of direct fixation fastener that is designed to have zero longitudinal restraint. In general, zero restraint is achieved by placing a formed rigid steel plate between the rail clip and the top of the rail base such that there is no contact with the top of the rail base. This device is generally used for long bridges and requires the installation of rail expansion joints at or near the bridge structural expansion joints. Zero longitudinal restraint systems are virtually all-resilient fasteners but may be of other designs under this definition.

Zero Thermal Stress Temperature

The temperature at which a string of continuous welded rail that has been restrained will not be stressed due to thermal expansion or contraction

Z Grade Crossings

At grade crossings, pedestrian safety treatments are designed to prevent people from walking directly onto the railroad right of way tracks. These treatments are typically offset pieces of fence with yellow tactile tile, 'STOP' stencil on the sidewalk and 'STOP HERE' sign on the fence when red lights are flashing. A secondary benefit of the treatments is that it draws attention to itself from pass vehicles because it visually narrows the width of the crossing and the signs close to the road can also be read by drivers.

Other

1D Lumped-Mass Model

A collision dynamics model for which each railcar is represented by a spring-mass system and is constrained to move longitudinally along the tracks.

50th- Percentile Adult Male[122]

A person weighing 164 pounds (plus or minus 3 pounds) and possessing the following dimension:

- Erect sitting height: 35.7 inches (± 0.1 inch)
- Hip breadth (sitting): 14.7 inches (± 0.7 inch)
- Hip circumference e (sitting): 42 inches
- Waist circumference (sitting): 32 inches (± 0.6 inch)
- Chest depth: 9.3 inches (± 0.2 inch)
- Chest circumference: 37.4 inches (± 0.6 inch)

95th Percentile Adult Male[123]

Except as used in 238.44 (f) (2), it means a person weighing 215 pounds and possessing the following dimensions:

- Erect sitting height: 38 inches
- Hip breadth (sitting): 16.5 inches
- Hip circumference (sitting): 47.2 inches
- Waist circumference (sitting): 42.5 inches
- Chest depth: 10.5 inches
- Chest circumference: 44.5 inches

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Acronyms

A

A
Amperes

AAR
Association of American Railroads

A-T
Anti-Telescoping Plate

AAS
Association in Applied Science

AASHTO
American Association of State Highways and Transportation Officials

AATC
Advanced Automatic Train Control

ABD/DB
Type of conventional pneumatic control values

ABMA
Anti-friction Bearing Manufacturers Association

ABS
Automatic Block System

AC
Alternating Current

ACSES
Advanced Civil Speed Enforcement System

ACV
Air Cushion Vehicle

ADA
Americans with Disabilities Act of 1990

ADU
Aspect Display Unit

AFC
Automatic Fare Collection

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AFLS
Automatic Flashing Light Signals

AGT
Automated Guideway Transit

Ah
Ampere Hours

AHJ
Authority Having Jurisdiction

ALRV
Articulated Light Rail Vehicle

ANSI
American National Standards Institute

API
Applications Interface

APM
Automatic People Mover

APP
Accident Prevention Program

APTA
American Public Transportation Association

APU
Auxiliary Power Unit

AREMA
American Railway Engineering and Maintenance of Way Association (Formerly AREA. Name changed January 1, 1998)

ASCE
American Society of Civil Engineers

ASCII
American Standard Code for Information Interchange

ASHRAE
American Society of Healing, Refrigeration, and Air Conditioning Engineers

ASME
American Society of Mechanical Engineers

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ASNT
The American Society for Nondestructive Testing

ASR
Approach Stick Relay

ASTM
American Society for Testing and Materials

ATC
Automatic Train Control

ATC
Advanced Transportation Controller

ATCS
Automatic Train Control System

ATD
Anthropomorphic Test Device

ATO
Automatic Train Operation

ATP
Automatic Train Protection

ATPM
Automatic Train Protection Manual

ATR
Above Top of Rail

ATS

- Automatic Train Stop
- Automatic Train Speed
- Automatic Train Supervision

AVG
Average

AVL
Automatic Vehicle Location

AWG
American Wire Gauge

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AWS

- American Wielding Society
- Auxiliary Wayside System

B

BC
Battery Charger

Brake Cylinder

BCP
Brake Cylinder Pressure

BCU
Brake Control Unit

BIM
Building information modeling

BOCC
Backup Operations Control Center

BP
Brake Pipe

BPP
Brake Pipe Pressure

BTE
Bench Test Equipment

C

CAA
Clean Air Act

C&C
Command and Control

CAD
Computer Aided Design

CBTC
Communications-Based Train Control

CCD
Car Control Device

CCTV
Closed Circuit Television

CDL
Commercial Driver’s License

CE
Conducted Emissions

CEM
Crash Emergency Management

CENELEC
European Committee for Electrotechnical Standardization

CEO
Chief Executive Officer

CD
Candela

CFE
Customer Furnished Equipment

CFR
Code of Federal Regulations

C.G.
Height of center of gravity of vehicle above top of rail.

CIE
Commission Internationale de l`Eclairage (International Commission on Illumination)

CIL
Certifiable Items List

cm
Centimeter

CMOS
Complementary Metal-Oxide Semiconductor

COO
Chief Operating Officer

CP
Control Pneumatic

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CPU
Central Processing Unit

CRT
Cathode Ray Tube

CS
Conducted Susceptibility

CSA
Canadian Standards Association

CSR
Contractor Safety Representative

CSTT
Centre for Surface Transportation Technology (Division of National Research Council Canada)

CTA
Chicago Transit Authority

CTDIS
Computerized Train Dispatch Information System

CWB
Canadian Welding Bureau

CWR
Continuous Welded Rail

CXF
Capacity Exit Factor

D

DAQ
Delivered Audio Quality

DARPA
Defense Advanced Research Projects Agency

dB
Decibels

DBDD
Database Design Description

DBMS
Database Management System

DC
Direct current; non-alternating in magnitude.

DCL
Difference in Cross Level

Deg.
Degrees

DF
Direct Fixation

DHA
Detailed Hazard Analysis

DIP
Dual In-line Package (switch)

DHS
Department of Homeland Security

DMM
Digital Multi-Meter

DMU
Diesel Multiple Unit

DOT
United States Department of Transportation

DRT
Desired Rail Temperature

DSLIM
Double-Sided Linear Induction Motor

DVQ
Delivered Visual Quality

DVM
Direct Volt Meter

E

EAB
Electronic Air Brake

E&H

Elderly and Handicapped

EAS
Emergency Alarm Station

ECC
Emergency Control Center

ECP
Electronically Controlled Pneumatic

EEU
Emergency Evacuation Unit

EIA
Electronics Industry Association

EIC
Employee in Charge

EFT
Extremely Fast Transients

EL
Electroluminescent

ELES
Elevator/Escalator

ELIST
Equipment List

EM
Emergency Management

EMC
Electromagnetic Compatibility

EMCCP
Electromagnetic Compatibility Control Plan

EMF
Electromotive Force

EMI
Electromagnetic Interference

EMP

- Emergency Management Panel

- Emergency Management Plan

EMT
Electrical Metallic Tubing

EMU
Electric Multiple Unit

EN
European Norm

ENS
Emergency Notification System

EOC
Emergency Operations Center

EOCC
Emergency Operations Control Center

EOIS
Electrically Operated Isolating Switches

EOP
Emergency Operating Procedures

EOT
End of Train

EPA
Environmental Protection Agency

ERC
Equivalency Review Committee

ESD
Electrostatic Discharge

F

FACP
Fire Alarm Control Panel

FAT
Factory Acceptance Testing

fc
Foot-Candle

FEA
Finite Element Analysis

FCM
Fracture Critical Members

FEMA
Federal Emergency Management Agency

FFD
Fitness for duty

FFT
Functional Fault Tree

FHA
Fault Hazard Analysis

FHWA
Federal Highway Administration

fl
Foot-lambert

FM
Frequency Modulation

FMEA
Failure Modes and Effect Analysis

FMECA
Failure Mode and Effects Criticality Analysis

FMP
Fatigue Management Program

FMVSS
Federal Motor Vehicle Safety Standard

FOD
Foreign Object Debris

FOM
Fiber Optic Multiplexer

FPM
Feet Per Minute

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FRA
Federal Railroad Administration (of the DOT)

FRMS
Fatigue Risk Management Systems

FSK
Frequency Shift Key

Ft.
Feet

FTA
- Federal Transit Administration (of the DOT)
- Fault Tree Analysis

G

G
Acceleration due to gravity

GCP
Grade Crossing Predictor

GFCI
Ground Fault Circuit Interrupter

GFI
Ground Fault Interrupt

GFS
Ground Fault System

GLPS
- Ground-Level Power Supply
- Ground-Level Power System

GPS
Global Positioning System

GTO
Gate Turnoff Thyristor

GUI
Graphical User Interface

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H

HEP
Head End Power

HEU
Head End Unit

Hg.
Mercury

HIC
Head Injury Criterion

HMI
Human-Machine Interface

HOS
Hours of Service

HP
Horsepower

HPPL
High Performance Photo Luminescent Material

HSR
High Speed Rail

HRI
Heavy Rail Intersection

HRT
Heavy rail transit

HRRT
Heavy rail rapid transit

HRV
Heavy Rail Vehicle

HSGT
High-Speed Ground Transportation

HSLA
High-Strength Low-Allow (steel) or Low-Alloy High Tensile

Ht.
Highest Rail Temperature

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HVAC
Heating, Ventilating, and Air Conditioning

Hz.
Hertz

I

IC

- Incident Commander
- Integrated Circuit
- Intercom

ICS
Incident Command System

ICD
Interface Control Document

ICEA
Insulated Cable Engineers Association

IE
Induced Emissions

IEC
International Electrotechnical Commission

IEEE
Institute of Electrical and Electronics Engineers

IGBT
Integrated Gate Bipolar Thyristor

IIC
Investigator in Charge

In.
Inches

IPC
Institute of Interconnecting and Packaging Electronic Circuits (now called Association Connecting Electronics Industries, but continuing the use of the abbreviation)

IRW
Independently Rotating Wheel

IS
Induced Susceptibility

ISO
International Standards Organization

ISO-OSI
International Standards Organization-Open Systems Interconnection

ITD
Individual Train Detection

ITE
Institute of Transportation Engineers

ITS
Intelligent Transportation System

IVPS
Intermediate Voltage Power Supply

J

JOHSC
Joint Occupational Health and Safety Committee

K

Kg
Kilograms

kHz
Kilohertz

Km/h
Kilometers per hour

kN
Kilonewton

L

LAHT
Low-Alloy High-Tensile or High-Strength Low Alloy

lb.
Pounds

lb-ft

Pound-foot

lbf
Pounds Force

LCD
Liquid Crystal Display

LED
Light-Emitting Diode

LLEPM
- Low-Level Egress Path Marking
- Low-Location Emergency Path Marking
- Low-Location Exit Path Marking

Lm
Lumen

LRRT
Light Rail Rapid Transit

LRT
Light Rail Transit

LRTN
Light Rail Thematic Network

LRV
Light Rail Vehicles

LSB
- Least Significant Bit
- Local Sensor Bus

LSHF
Low-Smoke, Halogen Free

LSM
Linear Synchronous Motor

Lt
Lowest Rail Temperature

LVB
Local Vehicle Bus

LVPS

Low-Voltage Power Supply

M

M/s
Meter per second

MA
Motor Alternator

MAC
Maintenance Allocation Chart

MAP-21
Moving Ahead for Progress in the 21st Century Act

MCC
Management Capacity and Capability

mcd
millicandela

MDS
Monitoring and Diagnostic System

ME
Medical Examiner

MHz
Megahertz

MIG
Metal Inert Gas (welding)

MIL
Military (related to US Department of Defense standards and other documents)

MIL-STD
- Military Standard
- Department of Defense Military Handbook

MM
Millimeter

MMIS
Maintenance Management Information System

MPa
Megapascal

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mph
Miles Per Hour

MR
Main Reservoir

MRL
Machine Room-Less (elevator)

ms
Milliseconds

MSB
Most Significant Bit

MSDS
Material Safety Data Sheet

MSP
Minimum Service Pressure

MT
Magnetic Particle Testing

MTBE
Mean Time Between Event

MTBF
Mean Time Between Failure

MTBFF
Mean Time Between Functional Failure

MTBHE
Mean Time Before Hazardous Event

MTTR
Mean Time to Repair

MU
Multiple Unit

N

N
Newton

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NBIS
National Bridge Inspection Standards

NCR
No Calibration Required

NDT
Non-Destructive Test

NEC
- National Electrical Code (also known as NFPA 70)
- Northeast Corridor

NEMA
National Electrical Manufacturers Association

NF
Narrow Flange (Wheel)

NFPA
National Fire Protection Association

Ni-Cad
Nickel-Cadmium

NICET
National Institute of Certification in Engineering Technologies

NIJ
Neck Injury Criterion

NIMS
National Incident Management System

NIST
National Institute of Science and Technology

NM
Newton-Meter

NMT
Network Management

NOR
A digital logic command/function/operation

NPN
A type of transistor semi-conductor device

NPRM
Notice of Proposed Rule Making

NRCC
National Research Council Canada

NRT
Neutral Rail Temperature

NRTL
Nationally Recognized Testing Laboratory

NTB
National Transit Database

NTC
Negative Temperature Coefficient

NTCIP
National Transportation Communications for Intelligent Transportation System (ITS) Protocol

NTD
National Transit Database

NTIS
National Tunnel Inspection Standards

NTSB
National Transportation Safety Board

NX
Entrance/Exit

O

O&M
Operations and Maintenance

OCC
Operations Control Center

OCS
- Overhead Contact System
- Overhead Catenary System

OEM
Original Equipment Manufacturer

OHA

- Operating Hazard Analysis
- Open Hazard Analysis

OJT
On-the-Job Training

OL
Operation Lifesaver

OLI
Operation Lifesaver, Inc.

OSHA
Occupational Safety & Health Administration

OTE
On-track Equipment

OTM
Other Track Material

P

PA
Public Address System

PAS
Public Address System

PB
Pneumatic Backup

PBC
Pushback Coupler

PBX
Private Branch Executive

PC
Physical Characteristics

PCB
Printed Circuit Board

PCC
Presidents' Conference Committee

PCE
Passenger Car Equivalence

PCM
Pulse Code Modulation

PHA
Preliminary Hazard Analysis

PL
Photo Luminescent Material

PLC
Programmable Logic Controller

PM
Preventive Maintenance

PMOC
Project Management Oversight Contractor

PMP
Project Management Plan

PNP
A type of transistor semiconductor device

POA
Participating Outside Agency

PPE
Personal Protective Equipment

PPM
Parts Per Million

PRESS
Passenger Rail Equipment Safety Standards

PRIIA
Passenger Rail Investment and Improvement Act (2008)

PRO
Pre-Revenue Operations

PROP
Pre-Revenue Operations Plan

PRLT
Preferred Rail-Laying Temperature

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PRSR
Pre-Revenue Service Review

PRT
Personal Rapid Transit

PSA
Public Service Announcement

PSC
Power Supply Controller

PSI
Pounds per Square Inch

PSIA
PSI Absolute

PSIG
Pounds per Square Inch (PSI) Gauge

PSTN
Public Switched Telephone Network

PTC
Positive Train Control

PTE
Portable Test Equipment

PTS
Positive Train Separation

PTU
Portable Test Unit

PTVA
Preliminary Threat and Vulnerability Analysis

PVC
Poly-Vinyl Chloride

Q

QPE
Qualified Protection Employee

R

R_a
Mean surface roughness as defined in ASME B46. I-2009

RAC
Rail Activation Committee

RAM
Reliability, Availability, and Maintainability

RAP
Rail Activation Plan

RC
Resistor-capacitors

RCL
Resistor-capacitors-inductors

RE
Radiated Emissions

RF
Radio Frequency

RL
Resistors-Inductors

RFG
Rail Fixed Guideway

RMS
Root Mean Square

ROW
Right-of-Way

RP
Recommended Practice

RRT
Rapid Rail Transit

RS
Radiated Susceptibility

R_{sm}
Mean peak spacing as defined in ASME B46. I-2009

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RtK
Right to Know

RTA
Rail Transit System

RTU
Remote Terminal Unit

RTV
Rail Transit Vehicles

RWP
Roadway Worker Protection

R_z
Peak to valley height as defined in ASME B46. 1-2009

S

S
Seconds

SAE
Society of Automotive Engineers International (formerly, Society of Automotive Engineers)

SAMIS
Safety Management Information Statistics

SAT
Site Acceptance Testing

SBD
Safe Braking Distance

SCADA
Supervisory Control and Data Acquisition

SCR
Silicon-Controlled-Rectifier

SEIU
Service Employees International Union

SEPP
Security and Emergency Preparedness Plan

SEPTA
Southeastern Pennsylvania Transit Authority

SERP
Security and Emergency Preparedness Plan

SGR
State of Good Repair

SHA
Sub-System Hazards Analysis

SI

- Systéme International d'unités
- International System of Units.

SIA
Specific Intensity per unit area

SIT
System Integrated Testing

SJ
Standard Joint

SMS
Safety Management System

SSLIM
Single-Sided Linear Induction Motor

SSPP
System Safety Program Plan

SSWP
Site Specific Work Plan

SLT
Shuffle-Loop Transit

SME
Subject Matter Expert

SMP
Standard Maintenance Procedures

SOCC
Satellite Operations Control Center

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SOIL
Safety Open Items List

SOP
Standard Operating Procedures

sr
Steradian

SRP
Seat Reference Point

SRP
Standard & Recommended Practice

SSCC
Safety and Security Certification Committee

SSCP
Safety and Security Certification Plan

SSCVR
Safety and Security Certification Verification Report

SSOA
Safety and Security Oversight Agency (also SSO, SSOO)

SSPP
System Safety Program Plan

SSRC
Safety and Security Review Committee

SU
Single Unit

SWP/APP
Safety Work Program/Accident Prevention Program

T

T-POLE
Trolley pole

TACV
Tracked Air Cushion Vehicle

TAM
Transit Asset Management

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TASP
Transit Agency Safety Plan

TBC
Train Braking Command

TBE
Train Braking Effort

TC&C Room
Train Control & Communications Room

TCRP
Transit Cooperative Research Program

TCU
Telecommunications Control Unit

TDD
Telecommunications Device for the Deaf

TDD
Telephone for the Deaf and Disabled

TES
Traction Electrification System

THOR
Test device for Human Occupant Restraint

TIG
Tungsten Inert Gas

TIR
Total Indicated Run-Out

TLC
Train Line Complete

TLV
Tracked Levitated Vehicle

TM
Traction Motor

TOD
Train Operator Display

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TPFS
Traction Power Feeder System

TPS
Traction Power System

TPSS
Traction Power Substations

TRB
Transportation Research Board

TSA
Transportation Security Administration

TSM
Transportation System Management

TTL
Transistor-to-Transistor Logic

TVA
Threat and Vulnerability Analysis

TWC
Train-to-Wayside Communications

TWU
Transport Workers Union

U

UFOV
Useful Field of View

UITP
L'Union Internationale des Transports Publics (International Association of Public Transport)

UJT
Unijunction Transistor

UL
Underwriters' Laboratories

UPS
Un-interruptible Power Supply

USC
United States Code

USDOT
United States Department of Transportation

UT
Ultrasonic Testing

UUT
Unit Under Test

UV
Ultraviolet

UXP
- Usable Exit Path Value
- Usable Exit Path

V

V
Volts

VAC
Volts Alternating Current

VC
Viscous Criterion

VCVRS
Vehicle Cab Voice Recording System

VDRS
Vehicle Data Recording System

VDC
Volts Direct Current

Voltage in Direct Current

VFD
Variable Frequency Drive

VIM
Vehicle Inspection and Maintenance (Committee)

VOD
Vehicle Operator Display

VOLPE
Volpe National Transportation Systems Center

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VOM
Volt/Ohm Meter

VPI
Vacuum Pressure Impregnated

VPP
Voltage Peak-to-Peak

VVRS
Vehicle Video Recording System

W

W
Watts

WF
Wide Flange (Wheel)

X

X-Over
Crossover

XR
Crossing Relay

Y

None at this time

Z

ZLR
Zero Longitudinal Restraint

Other

µ
Microns

µΩ
Microhms

MΩ
Megaohms

Summary of changes

No changes as this is a new document.

Document history

Document Version	
First Published	

[1] 49 CFR Part 673.5. Also at *Cornell University Law School CFR Definitions*
[2] 49 CFR Part 225.5 – Definitions. *Cornell Legal Information Institute www.law.cornell.edu/cfr/text/49/225.5*
[3] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7
[4] *https://patents.google.com/patent /US3851730*
[5] *https://www.collinsdictionary.com/us/dictionary/english/air-cushion-vehicle*
[6] *https:www.environmentalpolutioncenters.org.air*
[7] *https://www.dictionary.com/browse/air-quality*
[8] *https://www.merriam-webster.com/dictionary/alternative%20fuel*
[9] *https://www.oregonlaws.org/glossary/definition/ambulatory_disability*
[10] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7
[11] 49 CFR 238.5 Definitions *Cornell University Law School CFR Definitions*
[12] *https://www.thefreedictionary.com/Arterial+highway*
[13] 49 CFR Part 236.700 Definitions
[14] *NFPA 130 Chapter 3, Definitions 3.3.3*
[15] *NFPA 130 Chapter 3, Definitions 3.2.2*
[16] *http://www.railway-technical.com/trains/rolling-stock-index-1/train-equipment/brakes/brakes-glossary.html*
[17] *https://encyclopedia2.thefreedictionary.com/Automatic+Coupler*
[18] 49 CFR Part 236.708 Definitions
[19] 49 CFR Part 236.709 Definitions
[20] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7
[21] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7
[22] 49 CFR Part 236.711 Definitions
[23] 49 CFR Part 238.5 *Cornell University Law School CFR Definitions*
[24] *Ref. ASMR/IEEE definitions and abbreviations Version 18*
[25] *Ref. ASMR/IEEE definitions and abbreviations Version 18*
[26] 49 CFR Part 238.5 *Cornell University Law School CFR Definitions*
[27] 49 CFR Part 238.5 *Cornell University Law School CFR Definitions*
[28] 49 CFR Part 238.5 *Cornell University Law School CFR Definitions*
[29] 49 CFR Part 238.5 *Cornell University Law School CFR Definitions*
[30] 49 CFR Part 236.712 Definitions
[31] 49 CFR Part 238.5 *Cornell University Law School CFR Definitions*
[32] 49 CFR Part 236.701 Definitions
[33] 49 CFR Part 238.5 *Cornell University Law School CFR Definitions*
[34] 49 CFR Part 238.5 *Cornell University Law School CFR Definitions*
[35] 49 CFR 673.5 *Cornell University Law School CFR Definitions*
[36] Strictly speaking, the term "clearance diagram" refers to a diagram based on fixed obstructions along the right of way which must be cleared by passing trains; this is the sense in which the term is used by AREA. The diagram whose development is described in this recommended practice is called an "equipment diagram" by AREA. It would be described more completely as an "equipment

construction limit diagram", but this term is cumbersome. Thus, this recommended practice follows the common practice of referring to this diagram as a "clearance diagram".

[37] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[38] 49 CFR Part 236.796 Definitions

[39] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[40] *Transit Advisory Committee for Safety [TRACS] Report #14-02 to the Federal Transit Authority [FTA] July 30, 2015*

[41] 49 CFR 238.5

[42] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[43] *Transit Advisory Committee for Safety [TRACS] Report #14-02 to the Federal Transit Authority [FTA] July 30, 2015*

[44] *Transit Advisory Committee for Safety [TRACS] Report #14-02 to the Federal Transit Authority [FTA] July 30, 2015*

[45] *49 CFR 238.5*

[46] 49 CFR 238.5 Definitions

[47] 49 CFR, Part 238.113 *Emergency Windows Exits,*

[48] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[49] *The Testing Inspection of Engineering Materials*, H.E. Davis, D.G. Troxell and C.T Clement, McGraw-Hill Book Co., p. 239

[50] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[51] *49 CFR 673.5 Cornell University Law School CFR Definitions*

[52] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[53] *APTA developed the fire risk matrix by adapting the risk assessment methodology in MIL-STF-882D, Military Standard System Safety Program Requirements to accommodate the passenger railroad operating environment.*

[54] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[55] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[56] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[57] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[58] 49 CFR Part 673.5 *Cornell University Law School CFR Definitions*

[59] *49 CFR 238.5*

[60] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[61] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[62] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[63] 49 CFR Part 673.4

[64] 49 CFR Part 236.753 Definitions

[65] 49 CFR Part 673.5 *Cornell University Law School CFR Definitions*

[66] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[67] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[68] 49 CFR Part 236.754 Definitions

[69] 49 CFR Part 236.760 Definitions

[70] 49 CFR Part 236.761 Definitions

[71] 49 CFR Part 236.762 Definitions

[72] *49 CFR 238.5*

[73] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[74] *49 CFR 238.5*

[75] *49 CFR 238.5*

[76] 49 U.S.C. Chapter 53, and *49 CFR Part 673.5 Cornell University Law School CFR Definitions*

[77] 49 CFR Part 238.5 Definitions

[78] 49 CFR Part 673.5 *Cornell University Law School CFR Definitions*

[79] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[80] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[81] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7

[82] 49 CFR Part 238.5 Definitions

[83] 49 CFR 238.5 Definitions

[86] 49 CFR Part 673.5 *Cornell University Law School CFR Definitions*
[87] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7
[88] 49 CFR Part 238.5 Definitions
[89] 49 U.S.C 5329 and 49 CFR Part 673.5 *Cornell University Law School CFR Definitions*
[90] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7
[91] 49 CFR Part 673.5. Also at *Cornell University Law School CFR Definitions*
[92] 49 CFR 214.7 – Definitions. Also at http://www.law.cornell.edu/c/cfr/text/48/214/7
[93] 49 CFR Part 236.767 Definitions
[94] *Introduction to North American Railway Signaling (NARS) 2008 page 63*
[95] 49 CFR Part 673.5 *Cornell University Law School CFR Definitions*
[96] 49 CFR Part 673 5 *Cornell University Law School CFR Definitions*
[97] 49 CFR Part 673 5 *Cornell University Law School CFR Definitions*
[98] 49 CFR Part 238.5 Definitions
[99] 49 CFR Part 236.802 Definitions
[100] 49 CFR Part 236.802a Definitions
[101] 49 CFR Part 236.805 Definitions
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[103] 49 CFR Part 236.807 Definitions
[104] 49 CFR Part 236.808 Definitions
[105] 49 CFR Part 236.811 Definitions
[106] 49 CFR Part 236.812 Definitions
[107] *Introduction to North American Railway Signaling (NARS) 2008 page 63*
[108] 49 CFR Part 236.813 Definitions
[109] 49 CFR Part 236.818 Definitions
[110] 49 CFR Part 236.819 Definitions
[111] 49 CFR Part 236.820 Definitions
[112] 49 CFR Part 236.820a Definitions
[113] 49 CFR Part 236.822 Definitions
[114] 49 CFR Part 236.823 Definitions
[115] 49 CFR Part 236.825 Definitions
[116] 49 CFR Part 236.826 Definitions
[117] 49 CFR Part 236.827 Definitions
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[119] 49 CFR Part 238.5 Definitions
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[121] 49 CFR Part 238.5 Definitions
[122] 49 CFR Part 238.5 Definitions
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